The Builder.

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ILLUSTRATIONS.

New Municipal Buildings, Walsall.....Mr. J. G. S. Gibson, F.R.I.B.A., Architect.

1. Detail of Main Entrance.
2. General View of Exterior.
3. Interior of Council-Room.

Old London Churches: Illustrations to Paper by Mr. Andrew Oliver, A.R.I.B.A.

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The Mechanical Handling of Materials.

NEW subjects are of more importance to those engaged in the execution of constructional works and in the management of industrial establishments than machinery and appliances for moving materials from place to place in an expeditious manner and at the lowest possible cost. Considering the history of any product from the source, and particularly through manufacturing processes, to the place where it is to be used, numerous transportations by land, river, and sea are found to be necessary, varying from hundreds, or perhaps thousands, of miles down to a few feet. Among the various products assembled on the site of a large building or engineering work, and finally incorporated in the structure, are timber, stone, brick, cement, tiles, slate, steel, and other materials representing miles upon miles of transport, as well as countless acts of lifting, lowering, pushing, and pulling, which account for a large proportion of the cost price. Even when the materials have been collected in readiness for the builder, they have again to be carried into their respective places and adjusted in position, thereby involving different forms of transportation and handling which add to the cost of construction, and, if not economically performed, seriously reduce the profits of the contractor.

In the works where iron ore is smelted, where pig-iron is converted into steel, and where steel is rolled into beams, bars, and plates, the transport and handling of materials during the process of manufacture represent huge sums of money. The same applies to cement and brick works, and all other manufactories where raw materials are converted into finished products. Even the means of transport themselves, such as steamships, railway engines, and engines used in providing motive power for mechanical apparatus employed in handling goods, all require supplies of fuel, the provision of which often involves hand labour or the use of labour-saving machinery upon an extensive scale.

In the foregoing remarks we have suggested only a few of the chief materials of construction, but these are sufficient to show how great a proportion of the cost of natural and manufactured products is due to operations of the kind indicated. When we consider the enormous proportions of the mineral products of the United Kingdom, and the immense quantities of products imported into the country, it is evident that the question of handling possesses truly national importance. The mineral production of the kingdom is not far short of 300,000,000 tons, and of miscellaneous imported products, cereals and seeds alone represent nearly 20,000,000 tons. To handle these gigantic quantities in the course of every year in an economical manner, to say nothing of timber, stone, cement, iron, and miscellaneous merchandise, not only at the place of production or the port of arrival, but also during the process of distribution, obviously necessitates the use of machinery and apparatus on a most extensive scale. Thus the general subject is one of vital interest to every inhabitant of this country, and at the same time, of course, to the individual members of all civilised nations.

The expression which forms the title of this article is usually applied to transport over comparatively short distances and within the range of lifting and conveyirg machinery, that is stationary at defined points, or is capable of movement to a more or less limited extent. A fixed crane may be taken as an example of the former class, and a travelling crane as an example of the latter. The direction through which materials are moved may be entirely vertical or entirely horizontal, being performed in one case by a fixed hoist or lift, and in the other by a conveyor of some kind. But by the application of hoisting machinery to rails, ropeways, or equivalent devices, vertical and horizontal movements may be performed simultaneously or alternately, and the range of action can be increased from a few feet to several miles. In such an event the railway or ropeway, together with its supports and the actual lifting and conveying machinery, may be regarded as constituting a fixed apparatus of extensive scope, instead of considering the mechanical part separately as a travelling appliance. Owing to the ready response made by mechanical engineers to the demands of the mercantile and industrial interests, an extraordinary variety of appliances

is now available for moving materials from point to point, sometimes for a few inches or feet at a time as required in engineering and other workshops, and at other times for distances so considerable that the operation of handling is essentially similar to the transportation effected by a railway. Between these extremes there are countless types of apparatus, and as most of them combine the primary functions of vertical and horizontal conveyance, the establishment of an entirely satisfactory system of classification is by no means easy.

Until quite recently there has been no such thing in the English language as a treatise upon apparatus for the mechanical handling of materials. This deficiency has been removed by Mr. G. F. Zimmer, an engineer who has devoted much attention to the subject, having been engaged for several years in the design of elevators used in connexion with grain and flour, and later of installations applied to the handling of products such as ore, coal, and timber. Some of the information gathered in this way was presented in the form of a paper read by the same author before the Institution of Civil Engineers in February, 1903, and in the volume to which we now refer* will be found the substance of this paper, together with numerous descriptions and drawings of hoisting and conveying plant, the whole forming a book of more than 500 quarto pages and containing 550 illustrations. To describe and illustrate machinery of the kind single-handed is an exceedingly onerous undertaking, and to perform the task in a manner that would not be open to adverse criticism is almost impossible in view of the wide field covered, the difficulty and labour involved in the collection of particulars, and the paucity of available data. For these reasons the public should be ready to overlook a few deficiencies, and to accept with appreciation the immense amount of useful information that has been presented by the author. To be really satisfactory a treatise on machinery for handling materials ought to be written and compiled by two or three experts in different departments of this important and comparatively modern branch of engineering. Mr. Zimmer has done as well as could be expected from one man, who has only been able to complete his task in intervals snatched from the exercise of a somewhat exacting profession, and who is identified with but one or two main divisions into which the huge domain of the general subject is divided. Judging from internal evidence, the material embodied in the author's paper read before the Institution of Civil Engineers seems to have been the starting-point of the whole book, the remainder having been tacked on rather than incorporated.

The difficulty of classification, which we admit to be great, is increased by the attempt of the author to establish a distinction between appliances for the continuous and the intermittent handling of materials. A grain elevator, with a regular succession of buckets attached to an endless chain or rope, clearly comes into the former class, and a hoist, having a single bucket or equivalent device, as certainly comes within the latter. As the two classes of apparatus merge one into the other, it is hopeless to draw a really satisfactory dividing-line. A greater measure of success is attainable, however, by establishing separate divisions for lifting and conveying plant, and a third division for appliances representing combinations of the two first-mentioned classes. Thus three groups may be made, each with subdivisions, in which can be placed forms of mechanism intended for distinct branches of industry and commerce. Mr. Zimmer starts with a classification something like this, but after a few chapters his system breaks down, and the bulk of his manual is based upon an entirely different method of arrangement from that announced in the first chapter. The key to this confusion is suggested by a remark in the Preface, wherein the author says: "I found, perhaps before I was fully conscious of the fact, that a treatise on a somewhat neglected though vast section of engineering had grown up into my hands. At first, with the diffidence natural to one who has never cultivated literature, I hesitated to put my notes in the form of a book, but these doubts vanished that no book existed in the English language on this important branch of engineering." This quotation justifies the belief that the author has trusted a little too much to the process of natural growth, and has paid insufficient attention to the training, pruning, and grafting operations which are so essential in the garden of technical literature. In the following general review of the subject we shall have occasion to refer to some parts of the volume mentioned, but, for the reasons stated above, not always in the order adopted by the author.

Appliances for elevating, or hoisting, in a strictly vertical direction are few in number, and it is convenient to include with them the consideration of elevators only slightly inclined from the vertical. Machinery of this kind is largely used for the continuous hoisting of coal, coke, ores, cement clinker, grain, flour, and other materials in bulk; also of sacks, casks, and packages containing various kinds of substances. A continuous elevator is well represented by the apparatus generally adopted for hoisting grain at most large seaports, granaries, and flour mills. It consists essentially of an endless belt, to which buckets are attached at short intervals, the whole apparatus being enclosed in a casing and provided with a well, to which the material is continuously supplied, and from which it is continuously drawn, and a head from which it is discharged in a constant stream. The elevators adopted in gasworks, power stations, and other establishments are of similar character, although the details of design vary according to the character of the materials to be dealt with. Elevators for raising sacks, casks and bulky objects generally have platforms instead of buckets, and somewhat resemble the passenger lifts occasionally fitted in office buildings. Owing to the enormous quantities of material that can be transferred from one level to another by an elevator of the continuous type, this class of appliance is more useful for unloading and loading purposes than for the requirements of ordinary industrial works, and unless combined with conveying apparatus of suitable character its scope is somewhat limited.

Intermittent elevators are far more general. They are practically lifts or hoists, with one or two buckets or platforms, as the case may be. Mr. Zimmer gives an interesting account of some blast furnace hoists employed in England, Germany, and the United States. This occurs under the head of continuous elevators, which can scarcely be looked upon as a suitable place. The reader who is anxious to obtain details of mine hoists, hydraulic, electric, and other power lifts of the kind that are so essential in industrial establishments and on constructional works, will look in vain for guidance, although he may find incidental references to elevating machinery in the series of chapters dealing with "Unloading and Loading Appliances" and elsewhere. Considering the value attaching to lifts for raising materials from one floor to another in factories, workshops, and warehouses, for hoisting materials from ground level to the upper parts of a structure in course of erection, and in a book professing to be a complete treatise on the mechanical handling of materials some mention of such machinery is certainly a thing to be desired.

If elevators alone were used in large mercantile and industrial establishments, a good deal of hand labour would be required for feeding at the bottom and distribution at the top. Consequently, auxiliary devices are very generally applied in connexion with elevating machinery. This brings us to apparatus intended for transporting material in a horizontal direction. It is really very difficult to know where to stop when considering this branch of the subject. Perhaps it would be going too far to include a public railway system among horizontal conveyors of material. Nevertheless, industrial and contractors' railways obviously come within reasonable bounds as much as aerial cableways and kindred plant discussed in this treatise. When minerals have been hoisted out from the depths of the earth, or timber has been cut in far distant forests, the problem of economical transport is a serious one for the ultimate user, as well as for the owner of the mine or forest, who naturally has to face competition. Private railways and various systems of transport are adopted to convey the product to the nearest railway, river, or seaport. In America and elsewhere some very ingenious methods have been adopted for conveying timber and other materials by gravity inclines and water-chutes. In Norway, logs that have been floated down rivers are taken from the water and transported to the mill, often at a considerable distance, by means of a trough, in which runs an endless chain with spikes serving to engage the timber. Some account of these and other useful aids ought certainly to be given in addition to the methods of rope haulage and conveyance by cableways which Mr. Zimmer has described so admirably. We should also like to find something about railway lines in engineering works,

* *The Mechanical Handling of Materials.* By G. F. Zimmer, A.M.Inst.C.E. London: Crosby Lockwood and Son. 1905.

and upon the site of large contracts. The ingenious mode of dealing with materials by what is termed electric telpherage is one that should be found extremely serviceable on temporary works, and the analogous system of conveyance by runways is particularly valuable in manufacturing establishments. Live rolls installed at ground level in steel works are really invaluable for the automatic transfer of heavy girders and bars from point to point, and kindred devices are equally useful in feeding machinery of all descriptions, as well as in removing the finished or partly finished articles. We must point out, in justice to the author, that he has given a really valuable account of self-emptying railway trucks, which are gradually being adopted in this country. Mr. Zimmer is quite right in emphasising the advantages of these, by the aid of which many thousands of pounds per annum are already being saved. Their more extensive application would be of incalculable value to the railway companies, with ultimate benefit to the national industries owing to the consequent reduction of rates.

In treating of conveyors, such as are frequently applied in combination with elevating plant, the author is evidently quite at home. The modern worm conveyor is practically the same thing as the Archimedean screw used by the ancients. In its earlier form the worm conveyor consisted of a spiral attached to a central shaft made to revolve in a trough, and so to push the material forward in a continuous manner. In the present day this type of conveyor is better made, but the principle is unchanged. The worm conveyor is very largely adopted for transferring grain from place to place in warehouses and granaries, and when the spiral is fitted inside a tube the apparatus is excellently adapted for moving materials that require to be well-mixed, such, for instance, as sand and cement in the dry state for mortar mixing, and slurry in the process of cement manufacture. Scraper or push-plate conveyors, in which the trough is fitted with a moving endless chain, or rope, fitted with plates at short intervals or with bottomless receptacles, also find extensive use. Band conveyors, having a trough of flexible material, in the form of an endless band, are still more popular, but the most modern type of the appliance is the vibratory trough conveyor. This is of German origin, and consists of a long trough receiving the material at one end and transmitting it to the other by a succession of reciprocating movements. The trough is supported on spring legs fixed in an oblique position, and each forward stroke is made in a direction inclined about 30° from the horizontal. Thus the material is thrown forward and slightly upward, and, as the return stroke is quickly made, the material comes to rest at a point a little in advance of its original position. By repetition of the process the material progresses by a series of jumps, at the rate of from 40 ft. to 70 ft. per minute, towards the far end of the trough. Conveyors of this type have been extensively employed for draining, picking, classifying, and sifting coal, for handling materials that require cooling or drying during transit, for handling moist sugar in refineries, and for all the purposes to which conveyors are ordinarily applied.

We now pass on to the third group of appliances combining the operations of vertical and horizontal transportation. The most familiar types of this large family are cranes, which the mercantile and industrial classes of the entire world justly believe to be extremely useful for the economical handling of materials. We have no doubt that Mr. Zimmer shares this opinion, although there is little evidence of it in his treatise. Careful study of the book reveals the fact that incidental mention of cranes is actually made in sundry chapters, but the index merely suggests one section in which crane construction is particularly considered, and the general type there described is the high-level or cantilever crane, of which the Temperley transporter is a well-known example. When the time comes for a second edition we hope the author will make good the deficiency here indicated. Among the varied combinations that are described we find pneumatic elevators and conveyors for loading and unloading ships, but regret to notice that pneumatic dredgers receive no attention. This can scarcely be an oversight, for during the discussion of the author's paper at the Institution of Civil Engineers attention was particularly called to this valuable type of apparatus. As a matter of fact, with the exception of grabs, no reference is made to dredgers of any kind, nor to steam navvies, nor to trench excavating machinery. It is a genuine satisfaction to come to the excellent chapters wherein loading and unloading devices, self-emptying barges, coal-tips, coal handling plant, automatic weighing machinery, and other important branches of the subject are fully discussed and adequately illustrated.

Perhaps it is not quite correct to describe as deficiencies some of the omissions to which we have referred, for it is probable that the author has purposely confined himself chiefly to the discussion of means for handling materials in the huge quantities with which shippers and mine owners are accustomed to deal, and, as this volume proves in a very conclusive manner, the task has been sufficiently onerous. Still, there are many other forms of machinery and apparatus equally deserving of description. We may refer particularly to varieties of cranes, hoists, lifts, and conveyors, used in transporting raw materials and partly finished products through the different departments of brick and cement works, sawmills, and engineering shops. Systems of removing chips and sawdust in wood-working establishments and of dealing with wool and other substances in textile factories are also worthy of notice, and the elaborate plant employed in large building and engineering contracts for handling the constituent parts of mortar and concrete as well as for hoisting, conveying, and depositing these and other structural materials in place, represent another most important phase of the subject. Let anyone make a series of visits to works of the kind and he will realise how wide a field exists for labour-saving appliances other than those described by Mr. Zimmer, and how great is the need still remaining for a treatise dealing with mechanical aids for the handling of materials employed in these branches of industry.

NOTES.

Trafalgar Square.

A RATHER surprising letter from the Executive Committee of the Navy League appeared in last Saturday's *Times*, in regard to the artistic improvement of Trafalgar Square—surprising in this respect, that the Navy League should assume that because the monument to Nelson is in Trafalgar-square the square is in some kind of way their peculiar care. Trafalgar-square is a public place in the usual sense of the word, and the question of its decoration is no more a special concern of the Navy League than they are the body proper to advise in such a matter. We have been anxious for a long time to see a finer treatment of Trafalgar-square than the present; but we do not expect that any proposal to make it in a special sense a naval square, and to remove the existing monuments that are not naval, would receive public or official approval. Some of the suggestions made in Captain Crutchley's letter, though not new, are true enough; that the fountains, in point of design, are a disgrace to the site, has been said over and over again. But the letter entirely misses two important points which must be considered in any effort at the artistic improvement of Trafalgar-square. The first is the necessity of remodelling the front, and especially the cupolas, of the National Gallery so as to render the façade worthy of its position*; the second is the want of grass, flowers, and verdure generally in the square, which ought to be made a stately fountained garden. We observe that not only is this last point omitted in the Navy League letter, but that the Office of Works, in their reply, have gratuitously tabooed the idea before it was suggested; the conclusion being that in their judgment nothing is to be done to prevent the square being made a place of popular mass-meetings. As long as that idea is maintained, any attempt to make the square what it ought to be is of course thrown away. That what is popularly called "the finest site in Europe" should be left a bare yard in order to afford a meeting-place for mob orators to address the unwashed, who could find a dozen other open spaces to meet in, is only too characteristic of England, where politics are always put before Art.

Coal Production.

THE Blue book recently published relating to the output of mines and quarries contains some interesting figures as to the coal industry. The output of coal for the year 1904 is a record, reaching a total of 232,428,272 tons—an excess of over two million tons on that of 1903. The value of the output of 1904 is, however, less than that of 1903 by 4,375,763*l.*, the average price of coal having fallen from 7s. 7·93d. in 1903 to 7s. 2·58d. last year. In 1900 the average value per

* Since the above note was written, we are glad to see that in a letter to the *Times* by Mr. H. J. Mackinder, this necessity for remodelling the National Gallery front, if anything good is to be done with the Square, is strongly insisted on.—ED.

ton was 10s. 9¾d., and from the figures we quoted last year it appeared that, whilst the value of coal in this country was falling, in the United States it was rising, the value there in 1900 having been 5s. 3¾d., but 6s. 6¾d. in 1903. The United States, however, is a very large importer of coal, the import into that country being nearly half its export, so that, whilst a fall in the price of coal is serious for the industry in this country, it may be of indirect advantage to our transatlantic friends. The export of coal from this country in 1904, exclusive of bunker coals, etc., used in foreign-going ships, was 46,255,547 tons, and inclusive 65,822,035 tons, and here again a large increase is shown on the preceding year, and the coal tax has not apparently tended to lessen the export. The coal remaining for home consumption is placed at 166,606,237 tons, or 3·894 tons per head of the population.

Belgian Ports and Canals.

AT a time when projects for improving the Port of London have simmered down to the meagre residual scheme of the Thames Conservancy, and when the hands of those who would revive inland navigation are tied by the bonds of conservatism and vested interests, Belgium is busy with numerous works for the improvement of her seaboard and inland ports, and of her splendid system of inland waterways. Quite apart from the projected extensions at Antwerp, considerable activity is being displayed at Ostend, Ghent, and Brussels. The extensive harbour works at Ostend are now almost completed and will be opened during the present year. Good progress is being made in the enlargement of the Ghent-Terneuzen ship canal, and when the works have been completely finished ships of large size will be able to gain access to the port of Ghent. Brussels is already open to vessels of about 200 tons, a maximum that will be greatly increased by the widening of the Willebroeck canal between the city and the River Rupel. This operation and an important extension of the dock system are in active progress at the present time. Bruges has already been furnished with means of direct access to the sea and the newly-finished docks are fully occupied. As for canals, the Government are busily engaged in widening channels to provide for the passage of larger vessels not only on the main trade routes to France and Germany, but also on various local waterways. The new Canal du Centre, to connect the eastern and western divisions of the canal system, will complete the network of waterways along the coal-fields and place the industrial regions in direct communication with the seaports and towns of West Flanders. These and other works too numerous for individual mention will be of immense advantage to the country. It is worthy of note that they are the result of a definite and well-considered policy inaugurated by the Public Works Ministry, a department much needed in England.

Municipal Improvements.

AMONGST many interesting statistics contained in the Report of the Advisory Board of Engineers to the Royal Commission on London Traffic, none are more instructive than those which deal with the figures showing the relative expenditure of the railway and tramway companies on improvements as compared with the municipalities. Thus it is estimated that the former companies during the past twenty years have expended some 100,000,000*l.*, whilst during the past fifteen years the municipalities have but expended a little over 9,000,000*l.* in a like direction. The result has been that, whilst the railway companies have constantly had their assessments raised, and the rates have also themselves continually increased, the municipalities have certainly not expended the sums so received in providing increased facilities for the larger traffic the railway and tramway companies have brought to their doors. It is also observable that, whilst the Advisory Board in its Report states that the number of authorities create a serious difficulty in the way of carrying out any comprehensive proposals for improving the traffic in London, the Association of Municipal Corporations, meeting a day after this Report was published, passed a resolution that it was inexpedient that wide legislative powers should be conferred upon Government departments, and it was desirable that in legislation affecting the powers and duties of municipalities adequate freedom of action in administration should be secured to town councils. The public may, however, well begin to ask itself whether too great a discretion has not already been allowed to the local authorities whose tendency has been to take upon themselves duties, and to expend the rates on objects, wholly outside their legitimate sphere, whilst neglecting improvements they might well have given their attention to with direct benefit to the community.

Railway Rates and Charges.

A CASE brought by the London & North-Western Railway Company against a City manufacturer last week affords an illustration of the fact that railway companies have to be on their guard against others besides the passenger who travels without a ticket, and the man who nails a package of goods to the bottom of a "returned empty." If two ways can be found of accurately describing the same article, and in one case a lower rate will apply than in the other, the trader may fairly adopt the former description. But a deliberately false and misleading description is another matter, and in such cases the railway companies are properly entitled to protection. The exercise of such misguided ingenuity is, in the case of an iron girder or a truck of bricks, at once impracticable and profitless; but when we come to merchandise in boxes, etc., it becomes both practicable and tempting. Almost every article of commerce is now included in the General Railway Classification, and it may be mentioned that, roughly speaking, the rate applicable to each class is about 20 per cent. above the next lower rate. This shows the extent of the advantage to be gained by declaring a consignment in a lower class than it should be, and the railway companies assert that this is very frequently done. But when we are told that 90 per cent. of their customers are systematically defrauding them in this manner (as was stated in the case in question) one is tempted to regard the statement as an absurd exaggeration. The present case, the magistrate considered, proved that business men in the bulk were honest, and that the defendant was in no way to blame morally. In view of this decision, and of the famous pronouncement that "cats is dogs and rabbits is dogs," it is not surprising that, if anyone finds a more advantageous name for it, he ceases to "call a spade a spade."

Motor Vehicles.

AT a time when a Royal Commission is considering the question of motor traffic it may be interesting to note the number of such vehicles registered in London up to September 30 of this year. The return just issued by the Control Committee of the London County Council gives the following figures:—Motor-cars, 8,059; motor-cycles, 4,808. These numbers bear a very small proportion to the number of horse-drawn vehicles, and it will be in the recollection of our readers that, from a return given for the year ending May 31, 1904, in the Metropolitan Police District, the number of accidents attributed to motor vehicles was 1,817. At that time the number of motor vehicles was considerably less; during the last three months alone 371 motor vehicles have been registered, and on these figures it would appear that the accidents occasioned by motors is at least 15 per cent., a very high average, but not one to occasion surprise when the figures relating to the average speed in the central area of horse and motor vehicles as contained in the report of the Advisory Board of Engineers to the Royal Commission of London Street Traffic are also considered. These figures show that in the hours when traffic is slack in that area the average speed of horse omnibuses is 5½ to 8 miles, motor omnibuses travelling at 8¼ to 11½ miles, the speed of horse cabs being 6 to 8½ miles as compared with 12 miles in the case of motor cabs, the speed at crowded times being less, but in about the same proportion.

Recent Dock Construction.

CONSIDERABLE activity is evident in various parts of the country with the object of providing more fully for the requirements of modern shipping. The important branch docks and other works on the Mersey will be ready for use in the course of next month. As the undertaking, which represents an expenditure of nearly 540,000*l.*, was only commenced in April last year, the works and engineers' departments of the Mersey Docks and Harbour Board have distinguished themselves by the rapidity with which the works have been pushed forward. Another remarkable enterprise is the new Trafalgar dock at Southampton, recently completed at a cost of over 300,000*l.*, and formally opened last Saturday. This is the largest graving dock in the world, being 875 ft. long by 125 ft. wide, with the depth of 33 ft. It is equipped with the largest electrical crane yet built, capable of lifting a load of fifty tons at a radius of 87 ft. The dock is approached directly from the estuary of the river Test, which has been deepened by

dredging to 30 ft. below low water level, so as to provide access at all states of the tide for the largest Atlantic liners that are likely to be built within the next few years. Although the Trafalgar dock is a sufficiently noteworthy undertaking, it constitutes only one item of the programme inaugurated by the London and South Western Railway for developing the port of Southampton. The extensive dock schemes which are in progress at Grimsby and elsewhere, and the new project in connexion with Dover harbour, also indicate that the necessity for progress is duly appreciated by those interested in the shipping industry. London seems to be the only place where stagnation reigns supreme.

Concrete Building Blocks.

HOLLOW concrete blocks have become so common in American building construction that public authorities are beginning to consider the advisability of recognising them in building codes. As a matter of fact, the Building Department of Newark, N. J., have already drawn up a special section of their regulations referring to the new form of structural material. This promptitude deserves every commendation and shows how much more readily innovations are taken up in the United States than in our own country. Steel is not exactly a novelty, but it has not yet received adequate recognition as a material of construction in British building regulations. The same applies to concrete-steel which, although of more recent introduction, has been made the subject of legislation in almost every civilised country outside the United Kingdom.

Paint for Steelwork.

A VALUABLE lesson upon the qualities of linseed oil paint is furnished by the investigations made on the New York Rapid Transit Subway. The steel used in the construction of that work was delivered with a coat of paint composed of pure red lead and pure linseed oil, and was subsequently treated with a heavy, continuous coat of similar paint, consisting of 33 lb. red lead to one gallon of oil. Examinations made after the lapse of two years showed the existence of oxidation under the paint, and from photo-micrographs taken on one section of the line it seems probable that the red lead had actually operated to produce rust instead of preventing it. As for the linseed oil, the chemist by whom the investigations were conducted came to the conclusion that moisture had been carried through the film to the surface of the metal. Previous evidence exists to show that a film of linseeed oil may combine with water to form a semi-solid substance similar to soap, and it is only reasonable to infer that the mineral bases present in paint pigments assist the process of saponification. The results observed in New York demonstrate the fact that linseed oil paint is practically useless for the preservation of steelwork in situations where abnormal humidity prevails. The problem, however, is to find a form of paint absolutely impervious to moisture and gas.

The Housing Problem in Liverpool.

LIVERPOOL has always been a conservatively-minded city, and it appears to be about to follow a conservative policy in regard to housing. From the speech of the Chairman of the Housing Committee of the Corporation at its final meeting for the year last week, it appears that, in his opinion, the time has come for pressing owners to make improvement in existing dwellings rather than for the Corporation to build new workmen's houses. In 1864 22,200 houses were pronounced to be structurally insanitary; now the estimate is 8,500. The worst class of houses has now been dealt with, and the policy of the Committee is to endeavour to improve the remainder through pressure on the owners and not by municipal rebuilding. Without full details it is impossible to say if this policy is feasible or not. But it is not desirable for municipalities to do more wholesale municipal building than is absolutely necessary. It is a great temptation to a Corporation to do work in a wholesale way, to make a clean sweep of a block of buildings, and to erect model dwellings. The ratepayer necessarily has to suffer in his pocket, and if the same end can be attained at less cost and in a less heroic manner the more moderate should be followed

Harcourt House, No. 19, Cavendish-square.

HARCOURT HOUSE, on the west side of Cavendish-square, nearly all the site of which was recently acquired to provide additional accommodation for the service of the Western District Post Office in Vere-street, was formerly known as Bingley House. It was originally built for Robert Benson, Lord Bingley, in 1722-3; after Lord Bingley's death in 1731 it was bought by Simon, second Viscount and first Earl Harcourt, who sold it to William, second Duke of Portland. In the King's Drawings, British Museum, is a print, engraved by J. Rocque, of the original design "as it was drawn by Mr. [perhaps Thomas] Archer, but built and altered to what it now is by Edward Wilcox, Esquire." It appears as Bingley House in Rocque's survey of 1744-46. The stabling was rebuilt by Samuel Ware in the earlier half of the XIXth century; the house formed the town mansion of the sixth Duke of Portland and afterwards of the late Marquis of Breadalbane. The high screening wall, courtyard, and general air of seclusion give it an unusual appearance, less frequent in London than in the older aristocratic *quartier* of Paris, which is noticed in the "New Critical Review of the Public Buildings in London," 1736. An earlier house, if any, on the site has been gratuitously attributed to Inigo Jones: the laying out of Oxford, now Cavendish, square, was begun in 1717, long after Jones's time, the first buildings there being the two wings—at the corners of Chandos and Harley streets—ascribed to E. Shepherd and to James, of the mansion designed in 1720 by John Price, but not completed, for the Duke of Chandos. The two wings, of red brick and since pulled down, are depicted in T. Malton's aquatint, July 28, 1800.

Monument to Sir Thomas Browne.

AT Norwich, on the 19th inst., a statue was unveiled to the memory of the author of the "Religio Medici," a book so dear to the students of quaint and curious thought in English literature. Lord Avebury performed the ceremony, and made some remarks on the special character of Browne's mind and writings, and "hoped that the sight of his statue might induce many to read his books"; not a superfluous remark, for though his writings are known to every student of English literature, they are certainly not as widely read as they ought to be, for the wisdom and suggestive thought they contain. Sir Thomas Browne was a native of Norwich, which has thus, though late in the day, commemorated one of its most illustrious citizens. The statue, which is in bronze, is by Mr. H. Pegram, A.R.A., and represents Browne seated, in the costume of his period, looking thoughtfully at the broken portion of an ancient vase which he holds in his right hand; one of those "sad and funereal pitchers" the consideration of which prompted one of the most characteristic passages in his writings. The bronze was cast by Messrs. Hollinshead & Burton, of Thames Ditton. As a memorial statue the work is very original and of a vivid personality.

The Fine Art Society.

AT the Gallery of the Fine Art Society is a collection of water-colour drawings of Rome and Umbria, by Signor Alberto Pisa. Though not works of the first order, these form a collection of water-colour sketches of somewhat more than topographical interest; the best of them being some views in the gardens of the Roman villas, Borgese and d'Este. Considering that a considerable portion of the drawings deal more or less prominently with architecture, it is not as carefully treated as it might be; the columns in the "Temple of Saturn" (1) are too thin in proportion; in "View of St. Peter's from the Pincio" (9) St. Peter's is crooked; and in one or two drawings of the Colosseum the real size of the structure is not realised. Some of the drawings of the early basilicas, and others buildings where classical detail does not come in, are interesting and more satisfying from an architectural point of view. Mr. W. Foster's exhibition of water-colours of various kinds, under the title "Here and There," shows a capacity to treat effectively a great variety of subjects. Some of these are studies of birds, living and dead, painted with great care and brilliancy; in others, as in "Harvest, Sussex" (8) and "Skye, from Balmacara" (10), we have landscapes of no ordinary beauty of style and execution; buildings are well treated in various drawings of old English cottages and of street scenes at Hyères and elsewhere; and coast or beach scenery is treated with a marked perception of colour effect, in "Beachy Head" (43), "At Eastbourne" (47), "Low Tide" (55), and "Oyster Catchers, Warkworth" (65). Mr. Foster seems to be a water-colour painter of very all-round capabilities.

The Carfax Gallery.

AMONG "Some Oil Paintings by Deceased Masters" on view at the Carfax Gallery are a fine Turner of the early period (date not given), "The Lake and Castle of Inverary," and an example—"The Bridge at Rimini"—of Richard Wilson

at his best; the other Wilson, "Tivoli," is not equal to it. James Ward's "The Cornfield," with its old-fashioned figures painted in an old-fashioned style, is almost amusing from the present-day point of view; Reinagle's "A Farm and Pool," also in a *passé* style, is interesting in respect of the treatment of the buildings. The stiff religious pictures described as "School of Antwerp," "School of the Netherlands," etc., do not interest us much; and if the "Amorini in a Tree" is really by Stothard, it is unlike any Stothard we ever saw; nor can we feel much faith in the "St. Anthony" near it being by Gerard Dow. "Bathers among the Ruins," by Poelenburg and Steenwyck, is a very interesting example of its class; and there is a really fine life-size portrait by Goya. At the top of the room is also Whistler's capering portrait of Connie Gilchrist, an object of admiration to Whistler-worshippers, but to our mind equally questionable both in taste and drawing.

BRITISH SCHOOL AT ATHENS.

THE annual meeting of the subscribers to the British School at Athens was held at the Rooms of the Society of Antiquaries, Burlington House, on Tuesday, the Bishop of Bristol presiding.

The Report, which was taken as read, gave the following statement with regard to the work of the year:—The fourth campaign at Palaikastro lasted from March 28 to June 18. The Congress and the Lakonian excavations detained the Director in Greece, and the work in Crete was directed by Mr. R. McG. Dawkins, Fellow of Emmanuel College, Cambridge, who had spent two previous seasons on the site. The prevailing disorders in the island caused some inconvenience. The centre of this year's work was the temple area which in 1904 yielded the Hymn to the infant Zeus and other remains of a Hellenic sanctuary, on the eastern margin of the prehistoric town. In this region there proved to be unexpected depth of soil and very complete stratification, all periods from the Classical Greek back to the "Early Minoan" being represented. Of the temple itself, which was probably of wood, little remains, but its terra-cotta decoration had been recovered, including a frieze of chariots and metopes adorned with the head of Medusa. The enclosing wall of the temenos had been traced, and near it had been found quantities of offerings, vases and lamps, bronze shields, and also a bronze lion, which, like the terra-cotta lions of the Altar-hill at Praisos, may point to the survival of the old cult of Rhea beside that of her son, Zeus. The Bronze Age buildings underlying the temple proved to be especially rich in objects of the fine "Palace style," which was known to have flourished in Crete during the Egyptian Eighteenth Dynasty. These included painted jars with marine and floral designs, a hoard of thirty-six elaborately carved stone vases, and four ivory plaques engraved with lilies and other figures. Neither here nor in the poorer strata intervening between this and the Hellenic level was there any definite evidence of religious use. But in a slightly older stratum Mr. Dawkins came upon a quantity of bones of oxen which seemed to mark the position of an early place of sacrifice. Thus the lonely Hellenic temple, which stood a thousand years later on the ruins of the prehistoric town, occupied, whether by chance or by some direct religious survival, a site of immemorial sanctity. There were terra-cotta models of bulls' heads and a great mass of painted pottery of the beautiful transitional style which Mr. Evans called "Late Minoan I."—a most valuable find, for hitherto this period was not well represented at Palaikastro. So, too, with the lower strata; until this year they had plenty of "Middle Minoan" forms and designs, but very little "Early Minoan" material: this want, too, had now been supplied. Deep deposits under the temple area had furnished a quantity both of an older plain ware with dappled black and red surface and of the black ware with geometrical patterns in white which during the Third Millennium B.C. gradually developed into the polychrome Kamares style. With these "Early Minoan" remains the stratification ended; no regular Neolithic deposit had been found at Palaikastro, though stone axes are not uncommon in the district. But Mr. Dawkins had made a brilliant little discovery which goes far to fill this gap. He traced some of these axes, brought to him by a peasant, back to their finding-place, a cornfield in a depression of the high bare limestone plateau which rises behind the plain of Palaikastro. Excavation disclosed not only primitive pottery, bone needles, broken celts, and chips of obsidian lying thickest under a rock-shelter at one end of the plot, but the walls of an L-shaped two-roomed house, unmistakably of the same age, since within it were found twenty stone axes, more than half of them in brand-new condition. This discovery gave us, for the first time in the Aegean, a definite idea of a Neolithic homestead. In other directions Mr. Dawkins and his helpers, Messrs. Charles Hawes, Kirkwood, and Dickins, had made important progress. The main street of the prehistoric town has now been cleared for a total distance of more than 350 yds., and some of the side streets were further explored. Outside the town several small cemeteries were discovered, and Mr. Hawes, the anthropologist of the expedition, measured a number of skulls from "Late Minoan" earthenware coffins, obtaining data for comparison with the "Middle Minoan" skulls measured here in 1903 by Mr. Duckworth. The results of this season supplemented and complete those of previous years in a most satisfactory way. For the present further excavation would add little to our knowledge, and it was better that there, as at Troy and Phylakopi, part of the ground should be spared until researches elsewhere increased our comprehension of the evidence. The first site examined in Lakonia was that of Thalamai on the west coast, famous in antiquity for its oracular shrine of the Goddess Ino—the sacred spring mentioned by Pausanias is almost certainly identical with one outside the village of Koutiphari, the water of which welled up within a vaulted chamber of recent date and then flowed out across a sunken court which was still in part enclosed by a wall of fine Hellenic masonry. Their trial trenches showed many traces of ancient occupation round the spring, which was still reckoned the best in all the narrow strip of Northern Maina which extends between the Taygetus range and the sea up to Kalamata. But the whole neighbourhood must have been ransacked for stone again and again in the Middle Ages, when there was a considerable population here. The country side was studded with little Byzantine churches, often built of ancient blocks; Mr. Dickins discovered and photographed some very interesting sculptured marble capitals and screens, some of them exhibiting Western characteristics, due perhaps to the Frankish occupation. A few inscriptions were gleaned—one, an archaic dedication to Asclepius, gave a new form of his name—but no new light was thrown on the cult of the local goddess. At Geronthrae, the modern Geraki, a thriving place on the eastern margin of the Eurotas basin, Mr. Hasluck, Fellow of King's, and Mr. Wace, Fellow of Pembroke College, Cambridge, did some experimental work on the ancient Acropolis. There, as at Thalamai, the Hellenic remains had been used as a quarry by Frankish and later builders, and there was nothing to justify a large excavation. An interesting settlement of the early Bronze Age was located, a grave containing geometric pottery of a quite new type was opened, and some inscriptions found. Moreover, arrangements were made for the publication of a remarkable series of archaic marble sculptures, work of a local school in the VIth and Vth centuries B.C., which have been collected by the enlightened mayor of Geraki. A little digging was done at Angelona, near Monemvasia, as a result of a discovery made by Mr. Hasluck on an exploring journey. A farmer in clearing ground for cultivation had turned up a marble relief and other objects which suggested that there had been some sort of shrine on the spot. The clue was promptly followed up, with the result that practically the whole equipment of a local heroön had been brought to light. There was a fragment of the cultus-image of the hero, and the relief already mentioned, which is a little masterpiece of Vth-century art, showing the hero or perhaps a worshipper standing before an altar; there was a terra-cotta plaque on which he was enthroned, holding a drinking-cup and attended by a snake; there was the snake itself in bronze, some minor terra-cotta plaques and figurines, and a quantity of miniature drinking-cups of the kind that were so often represented in the hands of the hero on the Spartan reliefs. The whole find, by the wise decision of Dr. Cavvadias, was to be exhibited together in the Museum of Sparta, where it would furnish a most suggestive illustration of the large class of local sculptured slabs representing the deceased ancestor enthroned and attended by a snake. To complete the record of this year's work in Lakonia, mention must be made of a series of plans and fortresses begun by an Austrian surveyor, Mr. Seyk, under Mr. Hasluck's supervision. Those of Zarax and Epidaurus Limera had now been completed.

The Bishop of Bristol, in moving the adoption of the Report, said there was no nation more entitled to take part in ancient Greek things and Greek investigations than the English nation, considering that the whole of their earliest literature was written in Greek letters. He did not know that any of the other nations who were helping in this work could say the same thing. They were Greek letters slightly altered and cut on wood, and they found that there was no such thing as a horizontal line because the wood splintered. There was another fact which he hoped someone would take in hand seriously. It was a certain fact that things found in the investigations at Mycenæ were almost identical with tombstones in the East of Scotland, and if a Scottish antiquary was asked where these things came from he would reply without hesitation that they were Scottish. If that was so—and it was—then he thought they should study a little more than they had the connexion of this land of ours in the matter of decoration and the beautiful decoration to which he had referred. With regard to the excavations carried on by the School, no one could imagine, except persons as old as himself, what vividness past excavations had given to their study of Greek literature. Besides that, the whole tendency of the age was to dig and excavate into fresh stages of history, both to discover what was there and to test their existing writings by what they found and to show their influence on modern times. If they did nothing more than to vivify Greek literature by their discoveries and set right a great deal of Greek history, then he would say, "Go on as you are." The Chairman proceeded to deal with the growth of the spirit of investigation at Cambridge, which was fostered by various scholarships founded to send students for a certain number of years to foreign lands; and concluded with an appeal to the public to help forward the work of the School at Athens. They were told that the School intended to retire from the work at Palaikastro, although it was stated that there was no place where so many beautiful things could be found at so little expense. At first it struck him whether it would not have been wise to have gone on and exhausted the site, but perhaps it was well that they should leave this site until they had learned something from somewhere else and found what the relations of other fields were to the site, and so leave it to future generations to extend their investigations at Palaikastro when they had further knowledge. The reason the work had been done so cheaply was that the students had paid their own expenses. That ought to open their hearts, for a work which brought forth such self-denial ought to allow of further investigations than the present funds permitted. The past year had been rich in discovery, but he hoped there would be no withholding of support when the finds were not so interesting, for it was when they had a comparatively colourless report that the School needed the greatest help.

Sir J. Evans seconded the adoption of the report, and it was carried.

Mr. R. C. Bosanquet, the Director, said that the past year had been a particularly busy one for the staff of the School and a particularly productive one for the students. They had completed the Penrose Memorial Library, and no sooner was that completed than they had the Archæological Congress, which marked an important epoch in the development of the School. For the students it was a productive year, not on account of any action of the staff, but because they were fortunate in having half a dozen exceedingly able students, a good proportion of whom had spent several years in the country. A particularly happy event was the visit of the Queen. It was her third visit to the School, and she graciously presented her portrait. He did not propose to speak so much of particular discoveries that evening, but to give some idea of the range and variety, and he might say independence, of the work which had been done by the students of the School. Owing to the Congress it was impossible for him to proceed to Crete, and the work at Roussolahkos was entirely under the control of Mr. Dawkins, who carried it out with the highest degree of success. The work was now practically completed so far as they intended to continue it at present. The main street of the town had been traced further until it led them into an outlying block of buildings at the extreme end of the site which had been excavated last year. The whole length of street excavated was 350 yds., and several cross-streets had been traced a considerable distance. The principal work of the year was a complete excavation of what they called the temple area. There were five different strata, beginning with an early Minoan building lying 15 ft. below the surface. [Mr. Bosanquet illustrated the discoveries made by Mr. Dawkins by a number of lantern slides, several of which showed the drainage of a late Minoan house.] Another of the workers at Palaikastro was Mr. Hawes, a new member of the School. Mr. Hawes was an anthropologist who had been trained to this work, and he was fortunate in finding some old Minoan interments and a number of skulls. From Palaikastro Mr. Hawes went out to obtain data with regard to the living inhabitants of the island, and he had very remarkable success, and obtained in all measurements of 1,440 natives. He traversed the whole island, including the White Mountains, which was the centre of a revolution, but, thanks to a mixture of audacity and tact, he succeeded perfectly. The results would not be published for some time, but Mr. Hawes told him that his measurements confirmed the view that in Crete there existed in the mountains a race considerably taller and finer than the population of the plains, and his measurements showed that they were more long-headed. To show that Mr. Hawes had not neglected the wider aspect of archæological work, the speaker showed a number of photographs which Mr. Hawes had taken of places he had visited. The work in Crete had been many-sided, but it did not touch the Classical Period; the work in the Peloponnese had. They had attacked sites at Geronthae and at Angelona, and Messrs Tod, Hasluck, and Wace had explored almost every village in Southern and Eastern Lakonia. At Geratsi they excavated near the springs, and found many remains scattered which had been used in buildings of Byzantine and mediæval date. They did some work at Thalamai, and they found the churches in the district were very numerous, and consisted largely of ancient blocks. It was evident that some of these churches were on the sites of ancient buildings, for the great blocks could not have been carried there. Mr. Dickins, who spent some time in the district, devoted himself to churches, and in the end he was rewarded by finding some interesting marble capitals and screens. Several inscriptions were gleaned, including an archaic dedication to Asclepino. He also obtained a very interesting series of photographs of mediæval, principally Frankish, sculptures. Mr. Bosanquet exhibited a photograph of one capital, showing on one side the representation of a dancing bear, and on the other side two foxes yoked to a plough being driven by a bird. He could offer no explanation of the meaning of this, but it was an interesting piece of sculpture to which, he believed, attention had never been drawn before. Mr. Hasluck and Mr. Seyk spent some little time at Zarax, and a complete plan of the fortresses there was obtained. While exploring in this district Mr. Hasluck made a very interesting discovery of a relief in a peasant's house, which was excellent Vth-century work. He found out where it came from, and a small excavation was carried out, and a number of other objects were found, with the result that practically the whole equipment of a local heroön had been brought to light. This was the first instance of a whole series being found together. Mr. Tillyard came out to fill Mr. Tod's place in the library, and his work had been a study of the whole subject of Greek boundaries and frontiers. The frontier tower which was now exhibited had never before been photographed. Another journey by Mr. Hasluck into Broussa, in Bithynia, had resulted in the discovery of a very interesting Byzantine church. Mr. Wace also made a journey in the neighbourhood of Volo, and he visited the little-known islands of Skiathos and Skopelos. In conclusion, Mr. Bosanquet showed a number of photographs of the new library at the headquarters, including the memorial slab to the late Mr. Penrose, who, he said, was a man whose friendship, like his fame, had no national horizon. The Congress which had been held was a splendid illustration of the work which the School had long tried to do in fostering international co-operation in research.

At the conclusion of the director's address the election of officers was proceeded with. Dr. Walter Leaf was re-elected treasurer, Mr. Penoyre secretary, and Messrs. R. Blomfield, R. J. G. Mayor, J. L. Myers, and Professor Reid were re-elected to the Committee. Mr. W. Loring was elected to fill a vacancy on the Committee in place of Dr. Monro.

Mr. E. Waterhouse was re-elected auditor on the motion of Dr. Sandys, seconded by Mr. Tod.

Professor P. Gardner, in proposing a vote of thanks to the Chairman, said the Congress at Athens was the first of the kind which had taken place. It was an extremely interesting meeting, but the most important part of it was the formation of a permanent committee at Athens, consisting of the heads of the different foreign schools, in conjunction with the Greek Minister of Foreign Instruction, to produce co-operation between the museums, and to arrange for an exchange of duplicates, and, to some extent, control their publications. Therefore the Congress was no mere momentary thing, but it had resulted in an alliance amongst museums, and the federation of archæologists throughout Europe.

Mr. Macmillan seconded the motion, and it was carried, and the proceedings terminated.

THE ARCHITECTURAL ASSOCIATION.

THE first ordinary meeting of the Architectural Association for session 1905-1906 was held on Friday last week at Tufton-street, S.W., Mr. Louis Ambler, Vice-President, in the chair.

The minutes having been read and confirmed and some nominations having been read, the Chairman read the following list of seventy-three candidates, who were elected members, *i.e.* :—

R. G. Schute, Wilmslow.
A. D. Mallandaine Laverstock, Salisbury.
E. S. Hall, West Dulwich, S.E.
H. T. Barnard, Stroud Green, N.
D. L. Solomon, London, N.W.
D. S. Hake, London, S.W.
W. H. Crauford, Woodberry Down, N.
F. J. McC. Maxwell, Bedford Park, W.
F. C. W. Dakers, Brondesbury, N.W.
W. H. Wilson, Buckenham.
H. V. Love, London, W.C.
L. G. H. McCredie, London, E.C.
A. E. Harris, Lee, S.E.
A. W. Hall, Ealing.
R. H. Cock, London, S.W.
W. E. R. Randall, jun., Chatham.
C. J. Bathurst, Maida Vale, W.
A. MacConnell, Burntisland, N.B.
R. P. Oglesby, London, W.C.
T. F. W. Rolfe, Maida Vale, W.
R. W. Fry, Maida Vale, W.
H. Doné.
R. S. Prideaux.
E. J. W. Whitehead.
A. T. With.
A. E. Vey.
W. I. Keir.
C. E. Fellowes Prynne.
W. E. Trent.
R. A. Ross.
H. W. Brittan.
E. J. Haslehurst.
F. D. Danvers.
R. Pierce.
W. G. Gale.
J. Newton.
C. W. Denton.
W. H. Huckvale.
S. P. Schooling.
T. M. Ellis.
R. W. Cable.
L. Keir-Hett.
R. O. Bridger.
D. G. Shrubsall.
R. Knowles.
P. J. Waldram.
J. G. de Parada.
W. B. Jones.
E. Newman.
A. G. Blackford.
W. Cook, jun.
H. M. Robertson.
B. F. Matthews.
T. H. Barrow.
L. S. Wood.
E. E. Morgan.
O. R. Davis.
W. H. Louw.
T. M. Swales.
A. R. C. Eaton.
F. S. Jasper.
G. T. Power.
G. Sanderson.
F. H. Knight.
W. J. Jones.
G. C. Wilson.
F. G. Troup.
C. D. Carus Wilson.
H. Battiscombe.
P. A. Tilden.
A. L. Levy.
V. Reinaecker.

Building Fund.

The Chairman also announced that Mr. Howard Chatfeild Clarke had been reinstated, and that the following further donations had been made to the Building Fund, *i.e.* :—Messrs. H. Chatfeild Clarke, 10*l.* 10*s.*; H. Wigglesworth, 5*l.* 5*s.*; F. Bisset, 1*l.* 1*s.*; G. P. Bowie, 1*l.* 1*s.*; R. J. Buck, 1*l.* 1*s.*; G. Hubbard, 1*l.* 1*s.*; C. Wontner Smith, 1*l.* 1*s.*; J. Borrowman, 10*s.* 6*d.*; S. Box, 10*s.* 6*d.*; S. Chatfeild Clarke, 10*s.* 6*d.*; A. H. Fagg, 10*s.* 6*d.*; I. T. Sifton, 10*s.* 6*d.*; E. Howley Sim, 10*s.* 6*d.*; A. H. Ryan-Tenison, 10*s.* 6*d.* On the motion of the Chairman, a hearty vote of thanks was accorded to the donors.

Council's Report and Balance-sheet.

Mr. Francis Hooper, Hon. Treasurer, said that, according to the by-laws, it was necessary that he should, at the first ordinary meeting of the session, propose the adoption of the balance-sheet of the accounts for the past year which had been printed in the Brown-book. Those accounts spoke for themselves, and particular comment on any point seemed unnecessary. He had but to express his appreciation to their Secretary, Mr. Driver, and his assistants for the excellent manner in which the accounts had been kept during the past year, which had been testified to by the auditors, Messrs. Saffery. He could not omit, also, an expression of indebtedness on his own account and on behalf of the Council and the members generally to the Royal Institute of British Architects for their continued support of the evening schools and their fourteenth annual grant of 100*l.* towards the expenses. In regard to the Building Fund, he took occasion in September to publish the balance-sheet showing how they stood when the accounts were audited and what the liabilities amounted to. The amount of the debt then was just over 1,000*l.*, and it was his hope, and the hope of the Council, that this sum would be wiped off during the current session. Since the Association last met the donations had been very liberal, and they thanked all those who had helped them, and especially Mrs. Arthur Cates, who was the donor of the 1,000*l.* promised in such a handsome manner twelve months ago. He would not suggest that there were no anxieties in regard to the outlay which they had made, but they felt confident that before very long they would have wiped out the deficit in regard to the premises, and they would be able to look forward to extending the equipment of the building in the way they were all ambitious it should be equipped.

Mr. S. J. Tatchell seconded the motion, which was agreed to.

The Chairman then proposed, and it was agreed, that a vote of thanks be accorded to the Carpenters Company for donation of carpentry models to the day and evening schools. He said he understood that the collection was a magnificent one, and their best thanks were due to the company for their kindness.

On the motion of the Chairman, a vote of thanks was also accorded to Mr. Banister F. Fletcher for a gift of forty-one diagrams.

Mr. Tanner, Hon. Secretary, announced that the conversazione would be held on Thursday, November 2, in the premises of the Association.

Ecclesiastical Architecture of the City of London.

Mr. Andrew Oliver then read the following paper, which was illustrated by a large number of lantern slides :—

"In dealing with the ecclesiastical buildings of the City of London it must not be forgotten that the edifices at present in existence form but a small portion of those that were originally constructed. Various causes have left their mark to account for the destruction which has taken place at various

periods amongst these monuments erected by former generations in the vain hope that they would exist for all time. But although the original edifices have so completely disappeared, yet we are able to reconstruct them, and so are enabled to lay before us the glories of monastic London as it was in the palmy days of its ecclesiastical grandeur, the splendour of whose ruins can only be compared with those of Newark, Fountains, and Glastonbury. The first great wave of destruction, not only in London, but over the whole of England, took place in the reign of Henry VIII. and his successor, Edward VI., and it was at this period that the whole of the monastic edifices of the City were swept away. The second period of destruction took place at the Great Fire of 1666, when not only did the few remnants of the monastic establishments utterly vanish, but nearly the whole of the churches of the City were overwhelmed in the general ruins. It will thus be seen that there can exist, owing to these two great influences, but few examples of ecclesiastical architecture belonging to the earlier periods, as the majority of those at present in existence date from the period which elapsed after the Great Fire of 1666.

We will now take the subject under the following heads:—(1) Monasteries, (2) Churches before 1666, (3) Wren's Churches.

(1) *Monasteries.*

The religious orders to which they belonged were the Benedictines, who had three nunneries—St. Helen's, Bishopsgate; Holywell, Shoreditch; and the Black Nuns, Clerkenwell. To the Carthusians belonged the Charter House, the Cistercians, the Abbey of Eastminster. To the Grey Friars or Franciscans belonged the Monastery of the Grey Friars, Newgate; Christ's Hospital, where the Bluecoat School used to be; the Blackfriars, or Dominicans; and, just outside the City, the White Friars, or Carmelites. The Austin Canons possessed the greatest number of establishments—St. Bartholomew, Smithfield; St. Martin's-le-Grand, St. Mary of Bethlehem, and St. Katherine of the Tower; the Priory of the Holy Trinity, Aldgate; and St. Mary Spital, Shoreditch; the Nuns of St. Clair, or the Minoresses, a minor order of the Franciscans, where the Minories now is. The Austin Friars had a house which was near Broad-street. The Preceptory of the Knights Templars in Holborn, and later at the Temple; the Knights of St. John, or the Hospitallers, at Clerkenwell. All that now remains of the foregoing is the chancel of St. Bartholomew, Smithfield, and part of the cloister of the church of St. Helens, Bishopsgate; the nave of the church of the Austin Friars, part of the Charter House, the gateway, crypt, and the nave of the Priory of St. John, Clerkenwell, and the Temple Church.

St. Martin's-le-Grand, 1056-1548.—This was the greatest of all the monastic edifices in the City, as well as being the most important. It was founded in 1056 for a dean and secular canons, and dedicated to St. Martin, with the additional title of Le Grand, or extraordinary privileges of sanctuary. It was one of the churches from which the "curfew" was rung. Edward I., in his orders to the City for keeping the peace, commanded that "henceforth none should be so hardy as be found wandering in the streets after Curfew bell at St. Martin's-le-Grand." The college was surrendered in 1548, the church being pulled down in the same year. The General Post Office now stands upon its site.

Holy Trinity Priory, 1108.—The priory was founded in 1108 by Maud, wife of Henry I., in which she makes it "free of all subjection to St. Paul's," and gives to it "the gate of Aldgate." A charter of Henry I. grants that "the canons may close the way which runs between their church and the City wall," and a charter by a son of Stephen mentions that Maud and Baldwin, children of Stephen, were buried here. The "Liber Trinitatis," of which a translation is at the Guildhall, was written by Thomas Axebridge early in the XVth century. It states that the Priory was founded in 1108 by Queen Maud, in the place where Syred had of old a church, in honour of the Holy Cross and St. Mary Magdalene. Norman was the first prior, and "he built the gate of Aldgate from the foundations." Queen Maud wished to be buried there, but she was buried at Westminster in 1118. In 1132 the church was burnt, with nearly all its offices. Prior Norman died in 1147, and was buried before the high altar, and King Stephen's son and daughter were buried on the north and south sides of the altar. The plan shown is taken from the *Home Counties Magazine*, and it is a copy of the original now at Hatfield House. It bears the signature of John Symons, and it is dated 1592. The dimensions would appear to be—length, about 245 ft.; width, 69 ft.; and across the transepts, 120 ft. The chancel is eight bays in length, including the Lady Chapel, and two apsidal chapels are on the north and south sides; the nave seven bays up to the western pier of the central tower. The chapter-house is entered on the north side from the cloister, is square in form, and around the cloister are the usual offices attached to the priory. The plan shows the way in which the old buildings were turned into a dwelling-house. Coming down to later days, we can trace where the old buildings stood. The chapter-house site, and probably the walls, became St. James's Church, Duke's-place; Mitre-square occupies the site of the cloister, whilst Mitre-street passes right through the church, over the site of the high altar and the graves of the children of King Stephen.

Holywell Priory, Shoreditch, 1127-1539.—It was founded in 1127 by Robert Fitzjohn, prebendary of Halwich, and was dedicated to Christ, the Blessed Virgin Mary, and St. John the Baptist. The holy well from which it took its name was dedicated to St. Agnes. The entrance was through a gateway, which was standing in 1785. In the court-yard stood the priory church, probably of late Norman date, with windows Early English and decorated; a chapel of early XVIth century work upon the south side, next Bishopsgate, erected by Sir Thomas Lovell. In the glazing of the window were these lines:—

"All the nuns of Holywell
Pray for the soul of Sir Thomas Lovell."

Or, according to another authority:—

"All ye nuns of Holywell,
Pray ye, both day and night,
For the soul of Sir Thomas Lovell,
Whom Henry the Seventh made Knight."

It was suppressed in 1539 and taken possession of by Henry Wells by grant on August 5 and September 23, 1544. The whole site is now occupied by the Great Eastern Railway.

Blackfriars, 1176-1538.—This consisted of precincts, church, sanctuary, with four gates. It was founded in 1176, being removed from Lincoln's-inn-fields. New Inn now occupies the site of the first monastery. Edward I. gave them a charter and granted them permission to take land between Castle Baynard and the Tower of Montpicket, and also to pull down the City wall and take in all the land as far as the Fleet River, and also denied the City to rebuild the wall at the City's cost. The church, it would appear, was a very fine structure, about 66 ft. in width by 230 ft. in length, or rather larger than St. Saviour's, Southwark. There were two aisles, chancel, a cloister 110 ft. square, with chapter-house to the west 44 ft. by 22 ft. The cemetery, on the north side, was 90 ft. by 200 ft. It was surrendered in 1538.

The Greyfriars, or Franciscans, 1225-1538, occupied the site of the Bluecoat School, or Christ's Hospital. The monastery was founded in 1225, the choir built in 1289. The nave and the other monastic buildings were erected later. The whole church was rebuilt and enlarged between 1306 and 1327. It will be noted from the plan that it shows some peculiarities. There were no projecting chapels, but the aisles were very wide to allow of them being placed there. The nave was seven bays in length, with transepts and a central tower. The choir was also seven bays long, being screened off from the nave, and space provided for four altars. Along the centre of the choir there was a row of tombs. On the inside of the church was the great cloister, chapter-house, dormitory, and library, and the way to the fratery, infirmary, and other offices was through the cloister. In 1538 it was suppressed, and the Bluecoat School established there a few years later. The present church of Christ Church occupies part of the site of the ancient choir.

Priory and Hospital of St. Mary of Bethlehem, 1246-1547.—The Lunatic Hospital was removed here at the suppression from St. Giles-in-the-Fields, 1547, and afterwards to London-wall, and in 1814 to St. Georges-in-the-Fields.

The Eastminster or St. Mary of Graces, 1349.—Of this once magnificent building no records are known as to what the buildings were.

The Minories, 1293-1539.—The north wall of the Church of the Holy Trinity, Minories, is the outer wall of the ancient nunnery.

White Friars.—The White Friars or Carmelites had their house in Fleet-street. In 1350 the church was rebuilt, and the Bishop of Hereford built a steeple in 1420. At the dissolution the chapter-house became a private house, and the church was demolished. The convent refectory became the Whitefriars Theatre. The right of sanctuary lasted until the reign of James I., and the neighbourhood was known as Alsatia. An account will be found in the "Fortunes of Nigel," by Sir Walter Scott.

Churches Erected before 1666.

In the second of these divisions we find a complete sequence of architectural style from the Early Norman period to the middle of the XVIIth century.

The buildings may be classified under the periods as follows:—

The Norman Period.—St. John's Chapel in the Tower; St. Bartholomew, Smithfield; the crypt of Bow Church; the west end of All Hallows, Barking; the Round Church of the Temple; and the crypt of St. John's, Clerkenwell.

The Early English Period.—The choir of the Temple Church.

The Decorated Period.—Gt. St. Helen's, the Austin Friars Church, Bishopsgate.

The Perpendicular Period.—St. Andrew Undershaft; St. Olave, Hart-street; St. Giles, Cripplegate; and Chapel of St. Peter, in the Tower.

Transitional, Perpendicular, and Renaissance.—St. Catherine Cree.

The earliest example of ecclesiastical architecture that there is in the City is the Chapel of St. John in the Tower.

The exact date is somewhat uncertain. Gundolph, Bishop of Rochester, built the white tower about 1178, so that it is probably the date of the chapel, or maybe a little later. The chapel is divided into a nave and aisles with ambulatory, and an apse. The arcade is supported by twelve piers and two responds, of which six form the apse; the aisles, vaulted with a plain ground vault. The arches are plain and rest on massive caps. Above this arcade is a triform gallery. The whole is covered with a barrel-vault.

St. Bartholomew, Smithfield.—It was founded in 1123, and the founder, Rahere, became the first prior of the monastery. The Norman work on the chancel (what is now the nave) was executed by Rahere and his successor between 1123 and 1174. The transepts, with the Early English work, were added during the ensuing fifty years, and possibly the nave, the site of which is at present occupied by the churchyard, and also the gateway. To the Perpendicular Period belongs the range of clearstory windows, and what is known as Prin. Bolton's Pew and the Tomb of the Founder. The so-called pew is, in all probability, a watching loft, like we find at St. Albans and other places. The clearstory windows in the apse are modern, and were the work of Sir Aston Webb. The Lady Chapel is of Early English date, and is entered from the ambulatory of the choir at the east end. The plan shown gives the position of the monastic buildings which formerly belonged to it.

The Temple, 1185-1312.—The Knights Templars existed for about two hundred years, 1118-1312, and their first settlement was in Holborn, near Southampton-buildings. In 1180 they came to Fleet Street. The church was consecrated (1185) by Heraclius, patriarch of Jerusalem. The original church consisted of a round nave, the choir being added in 1240. The church consists of porch, a round nave, and choir. The west doorway is Transitional Norman.

The piers consist of Purbeck marble columns, with capitals, which support pointed arches, over which is an arcade of intersecting semi-circular arches. The clearstory windows above are round-headed; the choir, five bays in length, with nave and aisles. The vault is carried on marble shafts with richly-moulded capitals.

St. John's, Clerkenwell, 1100. — The Knights of the Order of St. John are said to have settled at Clerkenwell about 1100. The earliest portion of the present chapel, now the crypt, was erected at the end of the XIth century. The west of this there was situated a round church similar to the Temple Church, which was consecrated the same year, *i.e.*, 1185. The original chapel then became a crypt under the new church. The plan of the crypt consists of a nave of five bays, with chapels at the eastern and on the north side of one bay only, and on the south of three bays. There are other chambers on the northern side. The original chapel was of three bays, and perhaps terminated in an apse. Upon the building of the church above the crypt was lengthened to the extent of two bays. The eastern end of the present crypt marks the extent of the Priory Church. The crypt and present church represent the length of the choir. The gateway was erected by Prin. Docra in 1540.

Austin Friars.—Founded in 1259 by Humphry de Bohun, Earl of Hereford and Essex. The church, originally cruciform, containing nave, chancel, transept, and central tower, was entirely destroyed, excepting the nave, by Sir W. Paulet. The chancel extended as far as Broad-street, and the site is marked on the ordnance map adjoining the Church of St. Peter-le-Poer. The church was given to the Dutch congregation in the year 1551. The spire of the tower, which is shown in Peter Verscher's map, was destroyed in the year 1600.

The Charterhouse.—It was founded in 1301 by Michael de Northbury, Bishop of London. By Royal permission it was named "The House of the Salutation of the Mother of God." Another benefactor was Sir Richard Manny, who gave 13 acres of land to the monastery. There is not much now left of the old buildings, which were suppressed in 1537, and the Charterhouse School was founded in 1572 by Thomas Sutton.

Great St. Helen's, Bishopsgate.—This was the church attached to the Benedictine Nunnery. It consists of a north aisle, or what is termed the nuns' aisle. This was entered on the north side from the cloisters, the doorway of which is still to be seen, together with a curious squint. This aisle was separated by a screen from the parochial nave, which has a transept and two eastern chapels. The establishment, with refectory, chapter-house, and other buildings, was practically complete until the end of the XVIIIth century, when it was bought by the Leathersellers, and their present hall and St. Helen's-place were erected on the site. In the year 1475, or soon after, great alterations were made, as Sir John Crosbie left a sum of 500 marks. This consisted in the removal of the screen between the nuns' aisle and the nave and the insertion of larger windows. He directs his body to be buried in the Chapel of the Holy Ghost within the parish church of St. Helen within Bishopsgate. He also bequeathed various sums to the prioress and nuns and also to the parish priest, thereby making a distinction between the two foundations. The site of Crosby Hall was leased to him for ninety-nine years at an annual ground rent of 11*l.* 6*s.* 8*d.*, by Alice Ashfield, the then prioress. In 1538 the property was surrendered to King Henry VIII., and by him given to Thomas Cromwell, who, as we are told by a deed in the MSS. Department at the British Museum, sold it for the sum of 300*l.*

St. Ethelburga.—Before the suppression of the monasteries this church was attached to that of St. Helen's. It consists of a nave, chancel, and south aisle, with clearstory. The porch shows remains of XVth century date. The view given is of the date 1737, and it shows the changes that have taken place since that date.

All Hallows, Barking, was formerly attached to Barking Abbey. It consists of nave, chancel, aisles, and clearstory. The piers at the west end are of Norman date, and the east end belongs to the Perpendicular Period. Richard I. added a chapel on the north side. A brotherhood was established here in the reign of Edward IV., and Richard III. established a college of priests, all of which were abolished in 1548.

St. Andrew Undershaft.—The church dates from the early part of the Xth century. The northern portion and part of the south aisle were built at the expense of Sir Stephen Jennings, Lord Mayor, 1508, and it was completed in 1523 by William Fitzwilliam. It consists of a nave and aisles and clearstory and a lofty tower. The most interesting monument is that of John Stow, the earliest writer upon London, and to whom all authors upon the subject owe a debt of gratitude. The name Undershaft is given as it stood originally under the May-pole, or shaft. The church of St. Mary Axe was taken down in 1561, and its parish united to it. It is a well-known district for second-hand clothes dealers, as the old lines inform us :—

"Jews from St. Mary Axe, for jobs so wary,
That for old clothes they'd even axe St. Mary."

St. Giles, Cripplegate.—A brotherhood was founded there by Queen Matilda to St. Mary and St. Giles. The church, partially rebuilt after a fire in 1545, consists of nave, chancel, and aisles. In the churchyard is a part of one of the old bastions of the Roman wall. The houses, which formerly hid the north side, have been taken down, and a statue of Milton has been erected on the site. John Milton, the author of "Paradise Lost," Foxe, the author of the "Book of Martyrs," and Sir Martin Frobisher, the old Elizabethan sailor and explorer, were buried here, as the register records.

St. Peter, in the Tower of London.—The whole building was rebuilt in the reign of Edward I. Edward III. and Edward IV. tried various schemes to make the church collegiate, and similar to the chapels in the Royal Palaces of Westminster and Windsor. The last-named instituted a dean and three canons, but his death occurred before the idea could be completed. In the year 1532 a general repair was ordered, and it is to this date that the present building belongs. It consists of a nave of three bays, and a chancel containing one bay, and north aisle.

St. Olave, Hart-street.—It is one of three dedicated to St. Olaf of Norway. It dates from the middle of the XVth century, and consists of nave, aisles, chancel, and a low tower at the east end of the south aisle. The pulpit was originally in the Church of St. Benet, Gracechurch-street. The Plague of 1665 is commemorated by the gateway with its row of skulls under the pediment. Readers of "Pepys' Diary" will remember how proud the little man used to be of his appearance in church, and how vastly prim his wife looked.

St. Catherine Cree.—The church was built for St. Catherine's parish in the churchyard of the Priory of the Holy Trinity. At the dissolution the church was given to Lord Audley. In 1628 the church, all but the tower, was pulled down, and the present church erected. The building is a strange mixture of Gothic and classic architecture.

Churches Erected after 1666.

The series of buildings which followed the Great Fire, and which were the work of Sir Christopher Wren, were different in every respect from those which had been erected at a previous period. Up to that date the church architecture of the City resembled in the style, the detail, and general arrangement, that which was usually to be found in the architecture of the country, but, with the advent of Wren, a new style was created, and which belonged solely to the City of London. There is no city which shows such a great variety in its towers and spires, or in its church architecture, and all of this may be said to be due to the genius of one man. As may be supposed, there is a great more generalness in the design of some of the examples; but this may not be the fault of the architect, but through circumstances over which he may have had no control. But even if we allow this to be the case, one cannot but be struck with the beauty of many of the designs, and of their adaptability to the surroundings. They show not only great power in design, but, if we examine them, a marvellous grasp of constructive detail. The whole range of construction seems to have been drawn upon, hardly any of them being constructed in a similar manner.

St. Paul's.—The present cathedral of St. Paul, the grandest of Sir Christopher Wren's works, is the third building which has been erected. The first cathedral is said to have been founded in 597, and destroyed in 1087 by fire. In this latter year a new cathedral was built in the Norman style.

In the year 1240 the choir was rebuilt and enlarged by being extended over the site of the Church of St. Faith, when the parishioners were given the use of the crypt, and was called St. Faith under or in St. Paul's in 1256. The tower and steeple were completed in 1221, and the latter was burnt in 1561, and never rebuilt. It is said that part of the stone intended for the rebuilding of St. Paul's steeple was given by Charles I. to the Duke of Buckingham to use in the building of Buckingham House. Some of the present watergate is built out of this stone originally intended for St. Paul's. The cathedral was partly repaired by Inigo Jones, who added the classic porch or narthex at the west end. Sir Christopher Wren was called in, and he proposed to take down the Gothic arches and substitute round ones of a neat classic style, and erect a dome in place of the tower. These works were all stopped by the Great Fire, and various attempts made to patch the edifice, but, these being futile, there came Wren's opportunity for the present building.

The Rebuilt Churches.—In the Harly MSS., 4941 (British Museum), there are three schemes for the rebuilding of the destroyed churches; the number first proposed being thirty-nine, but this was altered in the final arrangement to fifty churches, St. Paul's not being included, as it was considered at the time that the matter was brought forward that the cathedral could be made suitable for public worship. In addition to these there were rebuilt in the XVIIIth century, about a dozen in all, by Nicholas Hawksmoor, who rebuilt St. Mary Wolnoth; George Dance, All Hallows-on-the-Wall; and others by James Gold, Staines, Gibson, and Cockerell. None of these, with the exception of St. Mary Wolnoth, are of much interest architecturally or otherwise, so it will not be necessary to refer to them more fully.

In describing the churches which were erected by Wren it will be impossible to give a detailed account of the buildings. All that can be done will be to enumerate a few of the leading examples.

Types of Churches.—In the churches which Sir Christopher Wren erected we find the following types :—

The basilica—*i.e.*, a parallelogram divided by arches, at St. Michael, Cornhill.

A nave, and north and south aisles, St. Mary-le-Bow.

At All Hallows the Great (now destroyed) a nave with only a north aisle.

St. Nicholas, Cole Abbey, shows a nave only, and at St. Stephen, Walbrook, we find the dome, the leading feature of the interior.

In the planning of the churches which were rebuilt in many examples they follow upon the old lines, and even occupy the original sites of the old foundations. In some instances the old walls have been re-used, or refaced, and many of the towers still retain the work of an earlier period.

Although Sir Christopher Wren was, to a great extent, tied by the old boundaries, yet he departed in many instances from the original ground plan and arrangement, and erected practically a new building.

Before this period most churches had followed one particular plan—*i.e.*, a nave and aisles, separated by piers and columns.

A structural chancel was a rare feature in the London churches, most of which had been rebuilt in the XVth century without a chancel, and the aisles being continued to the east end, a screen being used to cut off the portion which was used as a chancel.

The towers and spires of Sir Christopher Wren may be placed in four divisions :—(1) Towers; (2) Towers with Spires; (3) Towers with Lanthorns; (4) Towers Surmounted by a Dome.

Towers.—This division contains one-half of the number, numbering twenty-five in all, out

of fifty examples which were erected originally. In many instances it is possible that the original walls of the structure were left or repaired, and all that was done would be to add to the original structure. The additions chiefly consisted of a parapet wall, and sometimes we find stone vases, obelisks, or other architectural features at the angles, and, in some cases, round windows or openings inserted, and the walls refaced with stonework.

The second division, "towers and spires," is of two kinds, "stone spires," and "wooden structures covered with lead." In the first we place the destroyed spire of St. Antholin, which may be said to have been a true spire, and constructed in the Gothic style; St. Bride, Fleet-street; St. Mary-le-Bow; St. Dunstan's-in-the-East. In the second, St. Martin's, Ludgate; St. Edmund, Lombard-street; St. Nicholas, Cole Abbey. Towers with lanthorns, as St. Stephen, Walbrook; St. James, Garlickhithe; St. Michael, Paternoster. Towers with cupolas in lead—St. Magnus, London Bridge; St. Peter, Cornhill; and St. Peter, Benetfink, destroyed. A stone cupola was at St. Mary Magdalene, Old Fish-street, now destroyed.

Dedication of Churches.

The saints, to whom the churches were dedicated, show that many were repeated, the largest number to one person being St. Mary, or the Blessed Virgin. All Hallows eight, St. Michael seven, and St. Martin five; four to St. Benedict or St. Benet, St. Botolph, St. Peter, and St. Margaret; three to St. Bartholomew, St. Nicholas, St. John, St. Stephen; two to St. Anne; one with St. Agnes attached, St. Clement, St. Dunstan, St. Christopher, St. James, St. Laurence, St. Leonard, St. Mary Magdalene, the Holy Trinity, and St. Mildred; one to St. Alban, St. Alphage, St. Antholin, St. Augustine, St. Bride, St. Denis or Dionis, St. Edmund, St. Ethelburga, St. Faith, St. Gregory, St. Gabriel, St. George, St. Giles, St. Helen, St. Magnus, St. Pancras, St. Swithin, St. Thomas, St. Vedast, the Holy Sepulchre or St. Sepulchre, and St. Paul in the Cathedral. The dedication names present some peculiarities in names, as St. Margaret Pattens, St. Benet, Sherehog, St. Margaret Moses, St. Michael, Le Querne, and St. Andrew Hubbard.

The number of parishes is also a curious feature, and by far the greater number of parish churches are to be found near the river in the south-east.

St. Mary Aldermary and a large number of parishes all take the name of Mary, as St. Mary-le-Bow, Abchurch, Woolchurch, Wolnoth, Bothaw, at Hill, and others.

All Hallows, it will be noted, has the next greatest number of dedications, All Hallows, Barking, being the oldest, that of All Hallows, Thames-street, being divided into the Great, and Less.

Sometimes parishes were united, as when the Priory of the Holy Trinity, Aldgate, was founded; it included the parishes of St. Mary Magdalene, St. Michael. St. Catherine and the Blessed Trinity were made into one parish, as Stow says, of the Holy Trinity, but St. Catherine was given later to the parishioners of St. Catherine Cree. The sites of the destroyed monasteries were also made parishes, as Great St. Helen's, Bishopsgate.

The dedication is sometimes shown externally, as at St. Laurence, Old Jewry. The weathervane is in the form of a gridiron, or the gilded key of St. Peter, Cornhill.

In the names of the dedications we often find another name attached to that of the original saint, in order to distinguish one parish church from another. They may be grouped under the following heads:—Localities, as St. James "Garlickhithe or Hill"; Founders, as St. Peter "Benetfink"; Scriptural saints, St. Bartholomew; Danish or Anglo-Saxon, St. Olave; St. Botolph, to whom there was dedicated a church outside Aldgate, Aldersgate, Bishopsgate, and Billingsgate; Saints of the early church, St. Pancras; English saints, St. Dunstan; Founder of religious orders, St. Augustin; Guild saints or company saints, St. Martin of the Vintners, and St. Mildred of the Bakers."

Mr. J. D. Crace, in proposing a vote of thanks to the lecturer, said that in consequence of the changes which took place so rapidly about us in London it was valuable to have such information brought into compendious form for use and reference. People could hardly realise how great an interest there was in the subject of old London until they began to look into the matter in walking about modern London. He had, for instance, to remind himself very often that a street he was constantly passing through in the West-end, which showed a depression of the ground, represented the course of the old stream which supplied the City of London with water from the year 1255 and onwards. The estate in which the street was situated was still known by the name of the Conduit Mead Estate, and still belonged to the City of London. As to the Church of St. Bartholomew the Great, which had been so admirably restored, he recollected, when some partial restoration was going on about the year 1855 or 1860, that he went into the church one morning and he thought he saw traces of colouring in the Norman arches. He had a small ivory paper-cutter with him, and with that he scaled off some of the whitewash and found underneath a complete system of Norman colouring on the nave walls and on the Norman arches, blocked out very much as was the old colouring at Ely, he believed. At the time he referred to there was a factory at the eastern end, and he remembered being taken over that part of the factory by the owner, who told him that a great many remains of the departed monks had been dug up in the yard immediately outside his building. Round churches had been mentioned by the lecturer, and, of course, the Temple Church was a very interesting one; there was another interesting one at Northampton and one at Cambridge, but the one at Northampton was particularly interesting. It might be mentioned that the spire of old St. Paul's, which was burned in 1561, as they had heard, was then the highest in Europe; but it was a wooden spire, and a very remarkable one it must have been, and a magnificently conspicuous object in the views of London, for then the houses were all lower, and the mass of the cathedral, as one saw in the old views, stood out as a most telling object. Another point in connexion with these old churches was that many of the dedications were to old Saxon saints. Amongst others were four to St. Botolph, who was buried at St. Edmunds or near there, and the four gates which commanded the four possible roads to the saints' place of burial had churches dedicated to him. It was not a common dedication elsewhere, though he came across one a few weeks ago in Norfolk at Grimston. (The church had been beautifully restored by Mr. Bodley at his own cost as a memorial to his brother.) As to the Church of St. Magnus, the tower of which many of them had admired, when old London Bridge was in existence the tower was pierced by the footway of the bridge, which passed under the tower. As to Bow Church, the lecturer had not mentioned that the present name of the church was derived from the arched vaults beneath it. It was the Court of Arches; and the title of Dean of Arches and the Court of Arches still remained, having their origin in this old church. When Bow Church was rebuilt a vault and crypt were again built. They were greatly indebted to Mr. Oliver for bringing together such a quantity of valuable information about old London.

Mr. Hugh Stannus said, in seconding the vote of thanks, that in looking at the views and engravings of London he had been reminded of a remark made by Street about the beauty of London, with all its beautiful churches and steeples which still remained. When returning from Continental journeys, Street said that in crossing Cannon-street Bridge he looked upon London with pride—or words to that effect. He (the speaker) felt much the same, and he had mentioned to people who were returning from a Continental tour that in that view they had something as beautiful as anything they had seen abroad. The Church of St. Etheldreda, in Ely-place, which had returned to its old allegiance, was a magnificent example of English Gothic work. He never passed a church when the doors were open, especially on Saturdays when cleaners were about, without wanting to go in. They would all look forward to seeing Mr. Oliver's paper in print, for they would like to use it in some sense as a guide-book to these churches, and especially if some of the plans and views they had seen could be reproduced at the same time.

Mr. J. Johnson said he had prepared a few notes from the very interesting series of drawings of the churches of Sir Christopher Wren made by Mr. J. Clayton in 1848. Of St. Paul's they could not but be impressed by its exterior design as a magnificent masterpiece, especially excellent when viewed from some little distance, though, unfortunately, only portions of the building were thus visible owing to height of surrounding buildings. The transepts were very pleasing, also the western towers when not too much foreshortened, when the upper portion seemed to be too small for the lower part. As to the other churches, he would deal with those on a domical plan first. St. Stephen's, Walbrook, had one of the most charming interiors he knew of, and the width of its dome was 43 ft.; St. Swithin's Church, Cannon-street, had an octagonal dome, 45 ft. diameter; St. Mary, Abchurch, had a large dome for a comparatively small church. Its diameter was 54 ft., on five quinate arches from the square, and the effect was fine; St. Antholin's, Watling-street (destroyed), had an elliptical dome, 45 ft. by 33 ft., carried on columns, and it was made that shape on account of the street, which sloped off a little. Wren was always anxious to utilise the site to the best advantage, he never wasted space in his plans; St. Mildred's, Bread-street, had a 36-ft. dome, on pendentives from cross vaulting. As to these churches with domical roofing, he should advise students to study them whenever they had a chance of doing so. The next most interesting type of church were the galleried churches, and first of all must be mentioned the spacious St. James's, Piccadilly, which had no clearstory, which was the case with St. Andrew's, Holborn. These, with St. Bride's, Fleet-street, and St. Anne's, Blackfriars, were all of one type, *i.e.*, nave and two aisles. St. Clement Danes was the only Wren church that he knew of that had an apsidal end; the old tower was encased and a spire added by a pupil of Wren. The next type of church were those of similar section, but without galleries, such as St. Peter's, Cornhill; St. Mary-le-Bow, Cheapside; and Christ Church, Newgate-street, which had a clearstory. The remaining churches had one or two aisles or large spans with flat ceilings, with or without coves, but in several matters they varied owing to the peculiarities of site. There were hardly any of Wren's churches but what would repay examination, and even in the plainest of them externally there was most charming woodwork inside. St. Lawrence, Guildhall Yard, has splendid examples by Grinling Gibbons. As to the towers and spires, he had compared them so as to try and find data for their arrangement. The towers were in height four to five times the width; the lanthorns half the height of towers; and the spires were nearly the same height as the towers. St. Mary-le-Bow, the finest classical tower and spire in London, had a 32-ft. square tower; it was 111 ft. 7 in. up to the cornice, and from cornice to top of spire 104 ft. 6 in.; St. Bride's had a 30-ft. square tower, a height of 123 ft. up to cornice, and 104 ft. above; Christ Church, Newgate-street, had a 23-ft. square tower, 98 ft. to top of cornice, and 58 ft. to top of spire; St. Magnus, London Bridge: tower, 27 ft. square, 100 ft. to parapet, and 80 ft. above; St. Vedart, Foster-lane: tower, 20 ft. square, 80 ft. high to cornice, and 70 ft. above—the lower part of tower, therefore, being very little higher than the upper part. As to towers with stone lanthorns, there were three of them which were particularly interesting; they were smaller than the others, but well designed. They were:—St. James's, Garlick Hill, St. Michael's, College Hill, and St. Stephen's, Walbrook, all of which had 20-ft. square towers. The height of St. James's was 87 ft. to cornice, and 38 ft. above; St. Michael's, College Hill, 94 ft. to cornice, and 38 ft. above; and St. Stephen's, 83 ft. to cornice, and 44 ft. above, from which it would be seen that the dimensions of each part were about half the total height, whereas in the towers with spires the upper part was nearly equal to the lower.

Of stone spires, St. Antholin's (now destroyed) was the only example of a Wren church with a stone spire that he could recollect. It had a 20-ft. square tower, was 74 ft. to parapet, and 70 ft. to top. St. Margarets Pattens, Eastcheap, had a 21-ft. 6-in. tower, 106 ft. to parapet, and 84 ft. above; and St. Swithin's Church, which was very plain, had 18-ft. 4-in. square tower, 89 ft. to parapet, and 57 ft. above. The lead spires, though picturesquely treated, were inferior to the stone ones. St. Martin's, Ludgate Hill, was extremely pleasing, it had a 22-ft. tower, was 88 ft. to cornice, and 72 ft. to top of spire; while St. Mary Abchurch had a 20-ft. square tower, was 80 ft. high—giving four squares—and with a 60-ft. spire. St. Dunstan's was a very graceful structure, founded upon the beautiful example at Newcastle-on-Tyne. It had a 20-ft. square tower, was 93 ft. high to parapet, and 77 ft. to top. St. Michael's, Cornhill, had one of the most impressive, sturdy towers in London. As to towers of simple character, St. Andrew's, Holborn, had a 23-ft. square tower, and was 122 ft. to parapet; All Hallows, Lombard-street, had a 21-ft. 6-in. tower, and 105 ft. 3 in. high; St. Clement's, Clement's-lane, had 16-ft. tower, and was 86 ft. high; St. Mary Somerset, Thames-street, was a peculiar church (now destroyed), because it had a range of obelisks at angles treated effectively. There were several examples of towers, leaded spires, etc., which were not particularly happy in design, but all the towers and spires when viewed from one of the bridges afforded a varied and magnificent spectacle not to be equalled by any city in the world.

Mr. C. Lynam, of Stoke-on-Trent, said he was a stranger among them, but he was not a stranger to the works of the Association, whose Sketch Book reached him whenever it was due, and from which he found great gratification in the work which he saw there. Mr. Oliver had attempted a great deal in his paper, but he had accomplished his task very successfully. That task must have been a laborious one—one of much observation and one of great personal enthusiasm. As the slides of old St. Paul's passed before him he was wicked enough to wish that the building stood there now. He would emphasise that opinion in this way: Suppose that Westminster Abbey were swept away from London and a classical building put up in its stead, how many would feel, as he did, with those who had lived through the Gothic revival, which was now almost moribund? There would be some who would, and so there were those who enjoyed and gloried in the views of old St. Paul's. As to the Church of St. John's in the Tower, he ventured to say that there was no building in London of the same size that was more impressive in character. The lesson of Mr. Oliver's paper seemed to be to those who would profit by it to go and see again the churches they had already seen and to visit those that one had not seen.

Mr. Banister F. Fletcher, in supporting the vote of thanks, said that the Merchant Taylors' was the school which now occupied part of Charterhouse and not the Grocers'. As to round churches, there were four in England, and the one not mentioned was that at Little Maplestead. The chief thing that they as architectural students should gather from the paper was that there are a number of buildings in London from which we can study. That was the main thing brought before the student. Books were all very well, but we know that we must go direct to buildings and study them—their mouldings and planning and so on—if we were to get value out of them. The Lady Chapel at Canterbury, he might mention, was still used by the French Protestants, to whom it was handed over. The charming piece of late stellar vaulting at St. Sepulchre, Holborn, was one of the most satisfactory pieces of such work in England. As to what had been said about many churches in England having been erected by Catholics, in London we were fortunate that the great majority of churches were erected by Protestants for Protestant worship, and that was the great interest of Wren's buildings. Wren had some most unpromising sites to deal with, and the planning, which was well worthy of most careful study, showed some most extraordinary effects—notably St. Stephen's, Walbrook: square on plan, but most interesting inside. The lecturer finished somewhere about the time of Wren, but it might be possible for him to bring the subject of London buildings nearer to our own time. The buildings of Barry in London would make an excellent subject for another lecture. Look at the houses alone that Barry built in London! Such a building as Bridgwater House was a masterpiece of design, and that might be the subject of a paper in itself. It was the habit of some people who travelled—often not very far—to compare Paris, say, with London, to the detriment of the latter; but, in his opinion, Paris did not compare with our City. If one lived in Paris for three months, one got tired of it and of the monotony of it. There were wide streets, but they were uninteresting in character, and there was a want of individuality in the streets which one did not feel in London; one never got tired of London, for there were buildings of all periods and all styles, giving special interest and character to many districts.

The Chairman, in putting the vote of thanks to the meeting, said the paper must have taken a great deal of time to prepare, for there must have been a considerable amount of research necessary. Mr. Oliver had incidentally referred to Birch's book on city churches, and, as they knew, that book was full of beautiful photographs and pictures of churches, and it contains an interesting account of them as well. He thought it would be a very good thing if members of the Association would combine to measure up and draw all those churches which had not been drawn and measured, and if they would do that and would publish the drawings in the Sketch Book or in some other architectural publication, they would be doing a great service to present and future students.

The vote of thanks was then very heartily agreed to.

Mr. Oliver, in reply, said he had not given any details about St. Sepulchre, Holborn, because it was outside the City practically; it had late vaulting. It had not been possible to refer to all points. As to Mr. Fletcher's remarks about Barry's work, that would have been outside the scope of the lecture. With all these fine buildings in the City he hoped that another year there would be a better show of work for the Architectural Association prize.

The Chairman announced that the next meeting will be held on November 17, when Mr. J. A. Gotch will read a paper on "Old Manor Houses."

The meeting then terminated.

ROYAL COLLEGE OF ART EXHIBITION OF STUDENTS' HOLIDAY WORK.

THE South Kensington Sketching Club, formed by students of the Royal College of Art, are holding their exhibition of holiday work in the temporary iron building at the back of the Natural History Museum. The exhibition will remain open until November 4. No student's work is quite so interesting, perhaps, as that done by the students in their holidays. Holiday work is a good test of a student's ability and perseverance. Unfettered by the restraint of supervision, and without expert advice, he is thrown on his own devices, and expresses the individuality that is in him. Good holiday work is, besides, a gauge of the healthiness and activity of a school. The students at South Kensington are fortunate in that the professors and masters take an interest in their outside work, and offer prizes under various headings. Nothing is so important to an art student, whether it is in architecture, sculpture, or painting, as how he spends his time. As R. L. Stevenson has pointed out, the calling of an artist differs from all other callings in that he finds a pleasure in his work to a degree denied to all other callings whatsoever; holidays ought for him to mean change, not rest, from work, and a student who produces nothing during his holidays had better adopt some other means of livelihood where holidays, pure and simple, are not only legitimate, but a necessity.

Some of the architectural students have spent their time in making measured drawings of ancient buildings in a thorough and workmanlike manner. The drawings by Mr. H. Castle of Much Wenlock Priory of the XIth century win Professor Pite's and Mr. de Gruchy's prize; other students have worked out full-size sections through Gothic door-jambs and arch moulds, and there are a few architectural sketches on the walls. Undoubtedly, the way to learn architecture in mass and detail is to measure and plot on the spot; sketching has its place, chiefly for its real assistance in practice, and partly for the pleasure to be found in a field of so much scope. The studies for wall decorations are very attractive, those of Mr. L. Crane and Mr. O. Senior winning the prizes. Mr. O. Senior's oil sketches from nature are some of the best things in the exhibition; the sketches of Messrs. Clark, Woolway, and Baker are delightful, those of Mr. Clark being specially able. Miss Eyre wins Mr. Walter Crane's prize for a design for printed linen, and Miss Brennand the prize for studies of ancient stained-glass given by Mr. Bunney.

THE INSTITUTE FELLOWSHIP.

THE following letter from Mr. C. H. Brodie appears in the current issue of the *Journal* of the Institute of Architects. Without expressing any opinion on the point dealt with, we publish it so as to give it circulation among architects outside the membership of the Institute, who at all events ought to have the subject brought before them:—

To the Editor, *Journal R.I.B.A.*

"SIR,—After December 31, 1906, no architect can be elected a Fellow of the Institute but from the class of Associates unless, by special proposal of the Council, for unusual merit, and the number of such cases must of necessity be limited.

The above fact is not, I venture to think, sufficiently widely known or appreciated, and I would ask our Council, the Allied Societies, and the professional Press to call the attention of architects in some special way to it.

In the course of my duties to an important concern, having some 250 branches scattered all over England and Wales, I travel to very many towns therein, and see a vast quantity of good architectural work being carried out. On inquiry, I find that the architects do not, as a rule, belong to our Institute, and this is a grave reflection on them, and also, in my opinion, on the Institute and its Allied Societies.

One cause I fancy may be—and I say it with some trepidation—the professional jealousy which seems to exist in the provinces, and a somewhat sad exhibition of which has more than once recently been shown when men found duly qualified by our Council have been violently opposed, and sometimes rejected, at elections. I venture to ask if such a policy can possibly be otherwise than harmful to the Institute. For I believe that dozens of good men and true are thus prevented from presenting themselves. There are hundreds of men in busy practice, of fair age, who cannot possibly work up for the Examinations, and to keep such out of the corporate body is little short of a crime. These men, if they are eligible under the Charter, have an absolute *right* to election, and I do seriously ask that they come forward, and, further, that when they do, and are duly presented by the Council we elect for the purpose, no captious opposition be offered. The Secretary's letter published on page 519 of the *Journal* for June 10, 1905, is so clear and convincing that no words of mine are needed to show what is desired. The Institute in General Meeting has clearly laid that down: Every reputable practising architect doing good work is invited to come up for the Fellowship if he is eligible under the Charter. Better far, Sir, is it that we should admit one or two men who ought—some may argue—to become Associates than that, by an ill-judged opposition, we should scare away dozens, and perhaps hundreds, to whom no reasonable opposition could possibly be offered.

May I also suggest a further difficulty? Many men to whom I have talked on the matter point out that they do not know three Fellows who can personally vouch for them and their buildings. Here our Allied Societies could do a really good work. They could make the necessary inquiries and then provide the requisite nomination. I would even dare to suggest the appointment of a special committee of our Council to deal with such cases if necessary. It might easily be that when in a district the work of an aspirant could be visited by a Fellow whose word we could all rely on, and who might at the same time learn something of the candidate's reputation, which is no less important.

My zeal for the welfare of the Institute—and I hope that cannot be doubted—must be my excuse for this letter. As I have said, I enjoy somewhat unusual opportunities of knowing the men and seeing the good work that is done over a large part of the country. And I feel our Fellowship numbers might and could be nearly doubled if the requisite steps were taken. Such a strengthening would do much for the public, the Institute, and the art we all—no matter how humbly—follow and love.—Yours faithfully, C. H. BRODIE."

THE ARCHITECTURAL ASSOCIATION.—The members of the Architectural Association who are not already aware of the fact will be interested to know that their courteous secretary, Mr. D. G. Driver, has been elected a Fellow of the Chartered Institute of Secretaries.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A HOME COUNTIES District meeting of the Association of Municipal and County Engineers was held at Tottenham on Saturday, October 21. The business proceedings were held in the Council Chamber of the new Council Buildings, which have not yet been formally opened to the public. Mr. A. E. Collins (Norwich), President, occupied the chair, and among an unusually large gathering of members present were:—Messrs. J. Patten Barber (Islington), W. Nisbet Blair (St. Pancras), T. W. A. Hayward (Battersea), O. E. Winter (Hampstead), J. Lemon (Southampton), J. T. Eayrs (Birmingham), R. J. Thomas (Aylesbury), Hon. District Secretary, T. Cole (Westminster), Secretary, A. H. Campbell (East Ham), C. Chambers Smith (Sutton), P. Dodd (Wandsworth), C. Jenkins (Finchley), W. T. Loveday (Stoke Newington), E. B. Newton (Paddington), J. Pollard (Westminster), N. Scorgie (Hackney), F. Sumner (City of London), T. G. Taylor (Ramsgate), and others.

Mr. W. E. Warran, as Chairman of the Tottenham Council, heartily welcomed the Association, and informed the members that under Mr. Prescott's able guidance they had recently carried out most important undertakings with excellent results.

Mr. C. C. Knight, Vice-Chairman, who also welcomed the Association, said they were pleased to do so, as the Council owed such a debt of gratitude to Mr. Prescott.

The President briefly acknowledged the welcome accorded to the Association. He remarked, notwithstanding that Tottenham had made enormous strides and carried out great public improvements, the rates had actually fallen. That redounded greatly to the credit of their officers and the Council.

On the proposition of Mr. Chambers Smith (Sutton), seconded by Mr. Dawson (Leyton), Mr. R. J. Thomas, County Surveyor of Buckinghamshire, was re-elected Honorary Secretary for the Home Counties District.

Local Administration of Tottenham.

Mr. W. H. Prescott, A.M.Inst.C.E., M.I.M.E., Engineer and Surveyor, read a paper on the "Local Administration of Tottenham and its Development."

He said the area of the district was 3,033 acres. The rateable value was 483,360*l*. The General District rate for the half-year ending with the September quarter was 2s. 2d. in the pound, and the Poor rate for the same period was 2s. 2d. in the pound.

At March 31, 1905, the total amount of the Council's loans outstanding was 404,910*l*. Of this sum 41,705*l*. was allocated to the Council's Water Department (which had been transferred to, and was now controlled by, the Metropolitan Water Board), and would shortly be paid off, and 23,288*l*. to the Urban District Council of Wood Green, which district, prior to the Separation Act of 1887, formed part of Tottenham. The number of houses was 21,254. From the report of the Medical Officer of Health for the year terminating December, 1904, the mortality rate was 11·5 per 1,000, including 0·764 per 1,000 for the seven principal zymotic diseases (probably the lowest zymotic death-rate in the kingdom).

At the end of March, 1905, the total length of roads and streets within the district was 60½ miles, of which nearly 4½ miles were main roads and 4⅛ miles contributory roads. The whole of the main roads were paved with wood on a 6-in. foundation of Portland cement concrete, Jarrah blocks being used for the portion between the tramway metals, and creosoted deal for the breasts of the road. This work was performed concurrently with the laying of the tramway track, when it was being remodelled to suit the requirements of electric traction two years ago. The total cost per square yard worked out at 13*s*. 9d.

The cost of maintenance of the main roads was borne by the county authority, who also contributed a moiety towards the upkeep of the subsidised roads, one of which was partially paved with "red gum blocks" nearly five years ago at a cost of 4,123*l*. The cost per square yard in this case worked out at the rate of 15*s*. 8d., and the road was now in a most satisfactory condition considering the time the wood had been laid. The loan for this work was granted for a period of ten years.

The average cost of scavenging and maintenance of ordinary highways and main roads for the year ended March, 1905, worked out at about 243*l*. per mile.

The public streets at the present time were lighted solely by incandescent gas, supplied by the Tottenham and Edmonton Gas Light and Coke Company at 2*s*. 10d. per 1,000 cubic ft. The company's charge for supplying and erecting new lamp columns, fitted with single incandescent "C" burner, was 3*l*. 7*s*. 6d. each.

The statutory powers for the making up of private roads within the district were contained in the Tottenham Local Board Act, 1890, the provisions of which were, with a few exceptions, very similar to those contained in the Private Street Works Act, 1892.

The general construction was as follows:—9-in. hard core, 2-in. gravel, 4-in. Leicester granite, rolled in with granite chippings; footways were paved with artificial stone flags on 4-in hard core; granite kerb, 12 in. by 8 in., laid flat; channelling formed of three rows of granite setts; crossings formed of granite setts; kerb, channels, and crossings were laid on 6 in. of 6 to 1 cement concrete. The cost per foot run of frontage worked out at about 15*s*.; and the amount spent in private street improvements was about 25,000*l*. per annum.

A new outfall sewer, 5 ft. by 3 ft. 4 in., had lately been constructed at a cost of 30,000*l*., which was necessitated principally through the development of the London County Council Housing Estate, which alone was estimated to contribute over one million gallons of sewage per day of twenty-four hours.

The sewage was forced from the pumping station through 21-in and 30-in. cast-iron rising mains into the London County Council system situated in the Metropolitan Borough of Hackney, whence it eventually arrived at the northern outfall works at Barking.

It might interest some members to learn that one of the powers enjoyed by the Tottenham Council under its special Act of Parliament was the authority to charge building fees to pay the salaries of the building inspectors.

Five building inspectors were employed in this department (under the control of the engineer and surveyor), each of whom received a salary of 200*l*. per annum.

The fees received from builders more than covered the salaries of the five inspectors. Some members of the Association had recently suggested the sweeping away of existing by-laws and substituting a universal Building Act. It surely must have been forgotten that such an Act would probably repeal the private Acts that most large local authorities had expended a considerable amount of money and labour to obtain, and very many valuable clauses would then be lost altogether; the power to charge building fees, for instance, which some few authorities possessed, but which the blue pencil of the Local Government Board invariably strikes out of new Acts of Parliament, would probably be one of them. Whilst such an Act would give the advantage of uniformity, the author submitted it would be at the expense of the loss of elasticity; moreover, the task of getting such an Act through Parliament was not to be lightly thought of, while the still greater difficulty of getting obnoxious clauses amended after would be almost insuperable. In the author's judgment the experience of the London County Council with their two still-born Building Acts showed how futile any attempt to pass a universal Building Act would be.

The refuse destructor works were officially opened on June 23, 1904, and had been in constant operation ever since.

One complaint as to smoke was received when the destructor was started, but this was more fanciful than real. The weight of refuse destroyed during the twelve months ending June 30, 1905, was 21,757 tons, of which some 655 tons was fish offal; the greatest quantity of refuse destroyed in one day was 102 tons, and the maker's guarantee was 37 lb. per square ft. of fire-grate per hour, which gives 160 tons per day of twenty-four hours as the capacity of the plant. They also guaranteed an evaporation of ¾ lb. of water per lb. of refuse. The cost of burning worked out at 1*s*. 7·1d. per ton, exclusive of interest and repayment of capital. Up to the present there had been a ready sale for the clinker, old tins, etc.

When the provision of a destructor first came up for discussion it was considered jointly with a municipal scheme for lighting the district with electricity, generated from a station proposed to be erected on the destructor site, using the waste heat from the destructor plant for supplying a portion of the electricity machinery. The chimney shaft and destructor generally were designed and erected with this object in view. A change of Council had, however, resulted in the municipal electricity scheme being definitely abandoned.

The cost under the "contract system" amounted to 6,400*l*. per annum; the cost under the new system was 7,600*l*., included in which was an amount of 2,330*l*. 15*s*. per annum for the interest and repayment of loans. If, in addition, allowance was made for the value of the steam generated, there was a considerable saving under the new method.

The Council obtained a Provisional Order in July, 1902, and various schemes were prepared, but none were adopted by the Council.

After a chequered history, the Council had now decided, subject to the approval of the Board of Trade, to conclude an agreement with the North Metropolitan Electric Power Supply Company, who were covenanting to supply the district with electrical energy before October 1, 1906.

The district was visited with an epidemic of small-pox in 1901-2, which cost the ratepayers of Tottenham over 12,000*l*., and a temporary hospital was erected within the space of three weeks by the Council on land adjoining the destructor site to cope with the outbreak. The sum of 6,000*l*. was expended on buildings and tents, and over 600 cases of small-pox were treated at this hospital, a large proportion thereof being of a very malignant type.

The actual cost per head for treating the patients at the Council's hospitals was less than 7*l*., as compared with over 11*l*. per head which had to be paid by the Council for eighty-eight patients sent to South Mimms from the district.

The present Medical Officer of Health (Dr. J. F. Butler-Hogan) took office when they were in the throes of this epidemic, and never probably in the history of Tottenham was there a time when those to whom was entrusted the care of the public health and administration of sanitary legislation occupied a position of greater difficulty and responsibility.

The buildings were constructed of galvanised iron and timber on brick foundations, and were destroyed by fire on the cessation of the epidemic.

Competitive designs were invited for Council offices, baths, central fire-station, etc., in September, 1902, and a scheme was ultimately accepted by the Council. The works were commenced on May 16, 1904, and completed in October, 1905; the whole of the fittings for the offices were made in the Council's workshops, and the furniture of the Council chamber, committee-rooms, etc., was supplied and fixed by a London firm. The total cost of the scheme, including the acquisition of the site, was expected to reach 70,000*l*.

In 1900 the Council acquired an estate of 14 acres for 8,600*l*., and the author was directed to prepare a scheme for the erection of workmen's dwellings. The scheme was duly approved, and application was made to the Local Government Board for sanction to a further loan of 102,000*l*. to carry out the work. An inquiry was held on May 12, 1902, at which there was tremendous opposition by builders and others. Since this inquiry took place the London County Council had deposited plans for the development of a huge estate in Tottenham for housing an estimated population of 42,500 at an estimated cost of one and a half millions; the work was now in hand.

In view of this the Council decided in July of this year not to proceed further with the scheme prepared by the author, and the application for permission to borrow the sum of 102,000*l*. for the purpose had accordingly been withdrawn.

The Legal Committee had now been instructed to consider and report as to the

advisability of leasing the land for building purposes to suitable tenants, the Council reserving to itself the right to stipulate as to the building of houses and their construction.

Parks and open spaces had always been a subject of deep interest to the Tottenham Council. The open spaces in the district had an area of over 240 acres, which could never be covered by buildings, and was open to the enjoyment of the public for ever.

Bruce Castle Park had an area of 20 acres, and was purchased in 1892 at a cost of 15,000*l.* The park was beautifully wooded, possessing smooth lawns in deep shade, tennis courts, bowling greens, and an old and picturesque mansion, with a quaint central tower, known as Bruce Castle.

In 1827 the estate was put up to auction and bought by a family of schoolmasters of the name of Hill, who had views on education very far in advance of their times, and who made Bruce Castle School a great success. One of these masters became known throughout the world as Sir Rowland Hill, the introducer of the penny post, the birthplace of which was Bruce Castle.

Chestnuts Park and Recreation Ground was purchased in May, 1898, and had an area of 13 acres; it was laid out by the author principally as a recreation ground, with cricket and football pitches, bowling greens, etc., against a background of ornamental shrub and flower beds. The old mansion on the estate had been converted into a library and public reading-rooms.

The Council were the owners of 117¼ acres of land lying in the far east of Tottenham, locally known as the "Lammas Lands." An Act of Parliament was obtained in 1900 to acquire power over and extinguish the Lammas rights over these lands, which were now the absolute property of the public; football and cricket pitches were allotted by the Council to applicants, this being greatly appreciated.

When the London Water Bill of 1902 was introduced by the Government the Council was at once confronted with a most serious and important matter—a very thorny problem which required their careful thought and serious consideration; the question before them was whether they should ask the Government to include Tottenham in the area of supply proposed to be established under the Water Board or continue to keep the water undertaking under municipal control and management. It was sought by the Government in their Bill to transfer to the District Council so much of the plant and business of those companies as were in Tottenham, and the Council would have been required to refund to the Water Board the ascertained value of such plant and business. It was ultimately agreed by a unanimous vote that the passing of the proposed Bill would be highly detrimental to the district, and strong reasons were adduced for bringing Tottenham within the limits of the Act without in any way depreciating the value of the Council's undertaking. The valuation of the undertaking was prepared by the author, and in the end the sum of 77,700*l.* was paid to the Council by the Metropolitan Water Board for the plant and works, which they took over in June of last year.

This left a balance of over 30,000*l.* after paying off all outstanding loans, and the final agreement was considered by the Council to be eminently satisfactory.

The author would like to take this opportunity of saying how much the public of Tottenham were indebted to their representative on the Metropolitan Water Board (Mr. Councillor P. B. Malone, J.P.), who worked so indefatigably and successfully during the conduct of the negotiations.

There were 4½ miles (double track) of tramways in the district and 1½ miles (double track) of light railways.

The electric tramways belonged to, and were run by, the Metropolitan Electric Tramways Company, to whom also were leased the lines of light railways in Bruce Grove and Lordship-lane, constructed and owned by the Middlesex County Council under their Light Railways Order of 1903; the service was good and frequent, and rendered the adjoining county, together with the City and West-end of London, very easy of access.

An open-air swimming bath had been constructed on Tottenham Marshes. The work was put in hand at the beginning of last winter, mainly with a view to relieve the distress of the unemployed of the district, and the whole of the labour was derived from this source. The total cost was 4,000*l.*, of which 2,033*l.* was spent in wages. The author considered the employment of casual unskilled labour on this class of work most unsatisfactory, and estimated that the wages bill was increased in consequence to the extent of about 70 per cent.

The President promised that the Buildings By-laws Committee of the Association would not overlook the position of local authorities having special Acts.

Mr. J. Lemon (Southampton) proposed a vote of thanks to Mr. Prescott for his paper. He congratulated the Tottenham Council upon their ability to reduce the rates. His experience was that rates were going up everywhere, so if Tottenham were able to reduce their rates they were doing very well. He was glad Tottenham had got a good local Act, but they must not be selfish in the matter, and must not prevent other districts getting equally good powers. He did not think the Legislature would allow any more local Acts to be passed, because they wanted uniformity throughout the country. Mr. Prescott seemed to have arrived at the conclusion that if a General Building Act was passed the local Acts would be repealed, but that was not so. Further, the good points in these local Acts might be incorporated in the General Act and all the bad points omitted.

Mr. Gamble (Southwark), who seconded, said the feature of the paper seemed to be the unsatisfactory way in which the so-called unemployed had done the work at the open-air swimming bath. He had constructed a bath somewhat similar in size, 100 ft. in length by about 30 ft. in width, and the cost for wages was 380*l.* That fully bore out Mr. Prescott's statement as to the unsatisfactory way in which the men employed on that work carried out their duties.

Mr. Norman Scorgie (Hackney) supported the vote of thanks as a neighbour of Tottenham. In the last few years the improvements in Tottenham had been rapid and for the benefit of the inhabitants. At the same time the rates were rather high. Mr. Prescott had been more fortunate than most of them in his experience of red gum blocks. Three years ago he put down a test piece of 1,500 yds., and he wished to goodness he had never seen the stuff, and a good many others of the Metropolitan engineers were in the same unfortunate position.

Mr. Price (Lytham) was much interested in Mr. Prescott's remarks as to building inspectors. It had been his lot to work as a building inspector for five years in a fairly large town, and he held the first-class honours certificate in building construction of South Kensington and the diploma of the Municipal and County Engineers. He had had many years' teaching of building construction, and many boys who had been under his tuition were now Associate members of the Royal Institute of British Architects, and while they were strong artistically and æsthetically they were often very weak in constructional work. One of the greatest difficulties he had was to get them to distinguish between tensile and compressive strains, and he could not drive graphic-statics into them. Some of them could not tell a cast-iron girder from a rolled steel joist. Still they would be able to go into Tottenham as building inspectors.

Mr. T. W. A. Hayward (Battersea) remarked upon the special powers enjoyed by Tottenham under their local Act. In Battersea they had to pay the district surveyor to see that they had done their work properly, and some of them resented it.

The vote of thanks having been passed,

Mr. Prescott briefly replied to the questions asked, and thanked the members for their kind reception of the paper.

The members were then entertained to luncheon by Mr. Prescott, who presided, and the usual toasts were honoured.

Dr. Butler Hogan, Medical Officer, in proposing the health of the President of the Association, remarked that that Association had as much to do with the municipal progress of England as any Association that could be named. The medical officers of health had no greater friends and no abler colleagues in the administration of sanitary work, and particularly in the practical departments, than the Municipal and County Engineers.

A special call of the motor fire-engine was witnessed, and the afternoon was devoted to a round of visits, including the open-air swimming bath on Tottenham Marshes, the sewage pumping station, and Bruce Castle Park, where tea was served.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. E. A. Cornwall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Greenwich Borough Council 1,500*l.* for pipe sewers; Hammersmith Guardians 6,500*l.* for poor law purposes; Stepney Borough Council 3,770*l.* for electric lighting; and Woolwich Borough Council 5,111*l.* for electric lighting and street lighting.

Chairman's Address.—The Chairman, in the course of his annual review of the work of the Council, said that the enormous increase in the Council's responsibilities might be illustrated by comparing its financial operations in the year 1904-5 with those during the first year of its existence. In 1889 the Council took over a net debt amounting to 17,563,262*l.* At the end of March, 1905, this had increased to 44,620,266*l.*, of which 5,622,221*l.* was in respect of remunerative purposes not involving any charge on the rates. A large portion of this increase took place within the year under review, when the outstanding debt of the late School Board, amounting to 11,546,883*l.*, was added to the Council's net debt. The total expenditure of the Council had increased from 3,303,923*l.* in 1889-90 to 16,170,040*l.* in the year under review. The economic and social forces of the present day tended powerfully towards the concentration of the population in large towns. Especially was this so in the case of London, whose magnetic influence on the workers in the provinces had furnished many a theme. If allowed to operate undisturbed the effects of this concentration, combined with the natural growth of the population, were that the people crowded closer and closer together, to the detriment of health and comfort, and the growth of physical, moral, and social degeneration. The central parts of the City became more and more congested, all available space was occupied by buildings, and houses which were originally constructed for the use of a single family had to serve the purposes of a whole colony. Although, however, in particular instances, the condition of affairs was bad in the extreme, counteracting forces were, happily, at work, by which the municipal authorities of London were wrestling with this serious problem. These methods might be divided into two classes:—(1) Measures for remedying the insanitary conditions resulting from actual overcrowding; (2) means for mitigating actual, or preventing possible overcrowding by dispersal of the population. With reference to the first class, during the past year the Council had been engaged in the execution of five schemes, involving the displacement of 4,218 persons, and the provision of rehousing accommodation for 4,434 persons. Up to the end of the year the Council had, under Parts I. and II. of the Act, demolished insanitary property, covering an area of 29 acres, displaced 12,290 persons, and provided accommodation for 13,932 persons. Up to March 31, 1905, the Council had incurred a net capital expenditure of 964,748*l.* in respect of the clearance of insanitary property, and of 765,821*l.* for the erection of working-class dwellings upon the cleared sites. The latter figure, however, was of the nature of remunerative expenditure, the income derived from rents more than meeting the debt charges. As to the second class, the Council, by its tramways, possessed the actual means of providing cheap and speedy transit. Of the 115 miles of tramways within the county, ninety-seven and a half miles were owned by the Council on March 31 last. Of these the Council itself worked forty-seven miles, of which twenty-six and a quarter miles had already been adapted for electric traction. The total number of passengers carried during the year was 164,818,560, or 31,679,475 more than in the previous twelve months. It was safe to say that no feature of the Council's work was so

generally known and appreciated as the preservation and maintenance of parks and open spaces, which was another branch of health administration in London. There were over 7,000 acres of such spaces under public control within the county, while there were 7,350 acres outside the county under the control of London municipal authorities. During the last sixteen years the Council had expended on capital account a total sum of about 1,046,000*l.* in connexion with parks and open spaces, and the annual cost of maintenance amounted to 125,000*l.*

The Chairman was thanked for his address.

No. 17, Fleet-street.—Mr. Howell J. Williams asked the chairman of the Building Act Committee whether it was a fact that the new front of No. 17, Fleet-street was not in accordance with the Building Acts of London. If that was so, whether the Building Act Committee was approached with a view to obtaining an exemption.

Captain Hemphill said that, before 1894 there were thirteen Acts of Parliament relating to building, and this building being an ancient building, probably it was erected under these Acts. At all events, it had now been reconstructed presumably to the satisfaction of the District Surveyor.

Sir M. Beachcroft asked where the old front was. The new front was entirely new, probably based on the lines of the old one.

Captain Hemphill said he was unable to answer the question.

Westminster Improvement.—The Improvements Committee recommended that a ninety-nine years' lease be granted to the Victoria-embankment Contract Syndicate, Ltd., of the whole of the surplus land from the Westminster improvement. They reported as follows:—

"We desire to bring before the Council an advantageous offer made by a syndicate, registered as the Victoria-embankment Contract Syndicate, Ltd., for a lease of the whole of the land surplus from the Westminster improvement. As the result of negotiations we report the terms offered by the syndicate, which we have no hesitation in advising the Council to accept. These provide that the Council shall grant the syndicate a lease for ninety-nine years of the whole of the surplus land from the improvement. It has been agreed, subject to the Council's approval, that the syndicate shall pay an ultimate ground rent calculated at the rate of 4 per cent. per annum on the total gross cost of the improvement, including the cost of the purchase of property and compensation, the provision of rehousing accommodation, and the paving, etc., works. The syndicate at first asked that the Council would allow a peppercorn period of three years, but this was afterwards reduced to two years, with provision that the rent for the third year shall be 25,000*l.*, for the fourth year 32,500*l.*, for the fifth year 40,000*l.*, and that the full rent, estimated at 52,760*l.* a year, shall come into charge for the sixth and succeeding years. Having regard to the size of the area to which the syndicate's offer relates and to the time which must consequently elapse before it can be properly developed, we think the proposed arrangements for the payment of rent are reasonable. The ultimate estimated ground rent of 52,760*l.* a year, capitalised at thirty years' purchase, represents a sum of 1,582,800*l.* We believe that if the syndicate's offer be accepted the cost of the Westminster improvement will ultimately involve no charge upon the rates.

The syndicate state that they propose to erect, in brick or stone, buildings of fine architectural character. The expenditure in erecting the buildings on the Council's land, and on the additional land, is estimated at 2,500,000*l.*, so that the Council will have full security for its ground rent. Moreover, as about one-third of this sum will be spent in wages, it is apparent that constant employment during the next few years will be afforded to a considerable number of workmen. The Council will retain full control over the lines of frontage and the widths of the new and widened streets, and also over the architectural treatment of the buildings to be erected, the plans being submitted for approval in the usual way.

No portion of the land has been submitted to auction, but, having regard to the terms of the offer now made, we think it should be accepted by the Council. We consider that the fact that so large an undertaking is to be executed on this improvement under the Council's building conditions will have a beneficial effect on the disposal of the valuable surplus land in Kingsway and Aldwych.

The syndicate desire that powers shall be sought over the property to the west of the area of the Westminster improvement, included in the syndicate's scheme of 1898, but not included in the Council's scheme sanctioned by Parliament in 1900. The cost of acquiring this property is estimated at 550,000*l.* The Finance Committee, however, whom we consulted, thought it inadvisable that the Council, by applying for the necessary powers, should commit itself to a scheme involving such heavy expenditure on capital account. We then considered whether the Council should apply to Parliament for power to acquire the additional property, with a proviso that the Council should be at liberty, within a period of twelve months from the passing of the Act, to transfer its powers to the syndicate. After a careful review of the facts, and having been advised as to the form which the proposed legislation should take, we are of opinion that the acquisition of the land adjoining the site of the Westminster improvement shall, in accordance with the view which now commends itself to the syndicate, be dealt with in a Bill to be promoted, not by the Council, but by the syndicate. This will render unnecessary the outlay by the Council of the additional sum, estimated at 550,000*l.*, a course which did not commend itself to the Finance Committee.

If the syndicate obtain powers in respect of the additional property, they propose to widen Horseferry-road in continuation of the widening which is now being executed by the Council, and also to effect desirable improvements in St. John-street and Marsham-street. A considerable portion of this property is insanitary, and as the Bill will, of course, contain the usual provisions for the rehousing, at the cost of the syndicate, of the persons of the labouring class who will be displaced by the demolition of the premises, we consider that the Bill may well receive the Council's support. The Housing Committee, whom we have consulted, also approve the syndicate's proposal. . . ."

Mr. Horniman, the chairman of the Committee, said that the syndicate had permitted him to state that the gentlemen composing it were Lord Avebury, Hon. J. Scott Montagu, M.P., Hon. W. F. D. Smith, M.P., Mr. T. C. Warner, M.P., Mr. R. J. Price, M.P., Mr. Faithfull Begg, Mr. T. A. Welton, Mr. H. B. Marshall, and others.

Mr. Hubbard moved an amendment to add these words to the recommendation of the Committee:—"That it be referred to the Improvements Committee to bring up a scheme in time for the session of 1907 for the Council to acquire such additional property as to complete the improvement on the lines indicated by the syndicate." He drew attention to the fact that in 1898, not only the Council, but Parliament, rejected a similar scheme by a similar syndicate, and he failed to see that the circumstances had changed in such a manner as to warrant such a complete reversal of policy.

Dr. Cooper seconded the amendment.

Lord Welby said the circumstances had completely changed since the resolution of 1898. At that time the Council had no scheme for the electrification of the tramways, nor were they committed to the expenditure on the county hall, and a vast number of other schemes which would press heavily on the ratepayers within the next few years. In round figures, the Council had committed itself to capital charges amounting to between 12,000,000*l.* and 15,000,000*l.* since then, and as the ratepayers were suffering to an undue extent, the opportunity should not be missed, from quixotic motives, of saving a recoupment loss of 170,000*l.* The loss would disappear if the syndicate scheme was adopted.

Sir Melvill Beachcroft was anxious to know if the extensions of the Embankment and the Thames gardens were to be carried out by the syndicate or the Council.

Mr. Horniman said that by the Act of Parliament the spaces for the gardens and the extension of the Embankment were secured.

After further discussion, the amendment was rejected, only fourteen members voting for it.

Mr. Jeffery moved a further amendment that the whole question be referred back for further consideration, and report.

This was also rejected.

Mr. Johnson then moved a further amendment, which was identical with that proposed by Mr. Hubbard, except that the session of 1906 was substituted for 1907.

On a division, this was rejected by fifty-four votes to twenty-eight.

As the time had now arrived when only unopposed business could be taken, the whole matter stood over until the next meeting.

The Council shortly afterwards adjourned.

VICTORIA MEMORIAL, BLACKBURN.—The memorial to the late Queen which has been erected at Blackburn was unveiled by Princess Louise a short time ago. The work was executed by Mr. Bertram Mackennal, sculptor.

THE FRASCATI RESTAURANT.—Various alterations have just been carried out at this restaurant in Oxford-street, and at the same time a new masonic temple has been erected. The restaurant has been redecorated in blue, white, and gold, and an enlargement has been made to the winter garden, a new wing having been added. The builders were Messrs. G. Godson & Sons, of Kilburn, who carried out the work under the direction of Mr. C. H. Worley, architect. The constructional ironwork was by Messrs. Homan & Rodgers, and the painted decorations were carried out by Messrs. Campbell, Smith, & Co., Ltd., of Newman-street. The cedarwood panelling of the masonic temple was executed by the Fire Prevention Building Co., Ltd., of Fulham.

Fifty Years Ago.

FROM THE *Builder* OF OCTOBER 27, 1855.

LABOURERS' COTTAGES.

SIR CHARLES ANDERSON, in his paper on "Cottage Architecture," read at the recent meeting of the Lincoln Diocesan Architectural Society, said:—"In these days the poor have been driven into the towns from the country, and much obloquy has been thrown on landowners as if they had been the sole cause of this. No doubt they shared in the blame; but many causes have been at work to bring about this evil: the former poor law—the natural tendency of men to shift the burden of supporting the indigent from themselves upon others. But there was one other cause—the cost of building cottages. This was the problem he wished to see solved—viz., how a cottage having three good bedrooms, with suitable conveniences, could be built so as to be substantial, warm, convenient, not so unsightly as to destroy self-respect, and yet pay a fair interest on the money spent. Many proprietors had most laudibly spent their money in building cottages near their own residences, which were models of beauty and excellence. He named the villages of Belton, Blankney, and Hainton, as affording examples of this admirable munificence; but such models could not be followed in ordinary cases. We must have something less costly before we could expect proprietors to lay out their money. In different localities different materials would be found—stone, brick, tile, slate, and the relative cost of each would makes estimates differ, as well as the cost of labour. A simple mode of drainage, the quality of mortars, the pitch of roofs, the height of rooms, the situation of doorways—all these require careful consideration; and it would be one of the most beneficial tasks of the society to endeavour to obtain plans which had been tested, with vouchers for the cost of all the items, and the experience of the inmates as to their comfort, in order to arrive at what was wanted.

Illustrations.

MUNICIPAL BUILDINGS, WALSALL.

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We now give three illustrations of the completed building, from photographs kindly lent by the architect.

The general contractors for the building were Messrs. Armitage & Hodgson, of Leeds; the decorative carving has been executed by Mr. H. C. Fehr; the furniture in the Council Chamber is by Messrs. C. Pratt, of Bradford. Mr. W. C. Lee acted as clerk of works.

A perspective of the interior of the large hall, as then intended, was given in our issue of October 6, 1900; and a view of the main staircase, from a drawing, appeared in our issue of May 13 of the present year.

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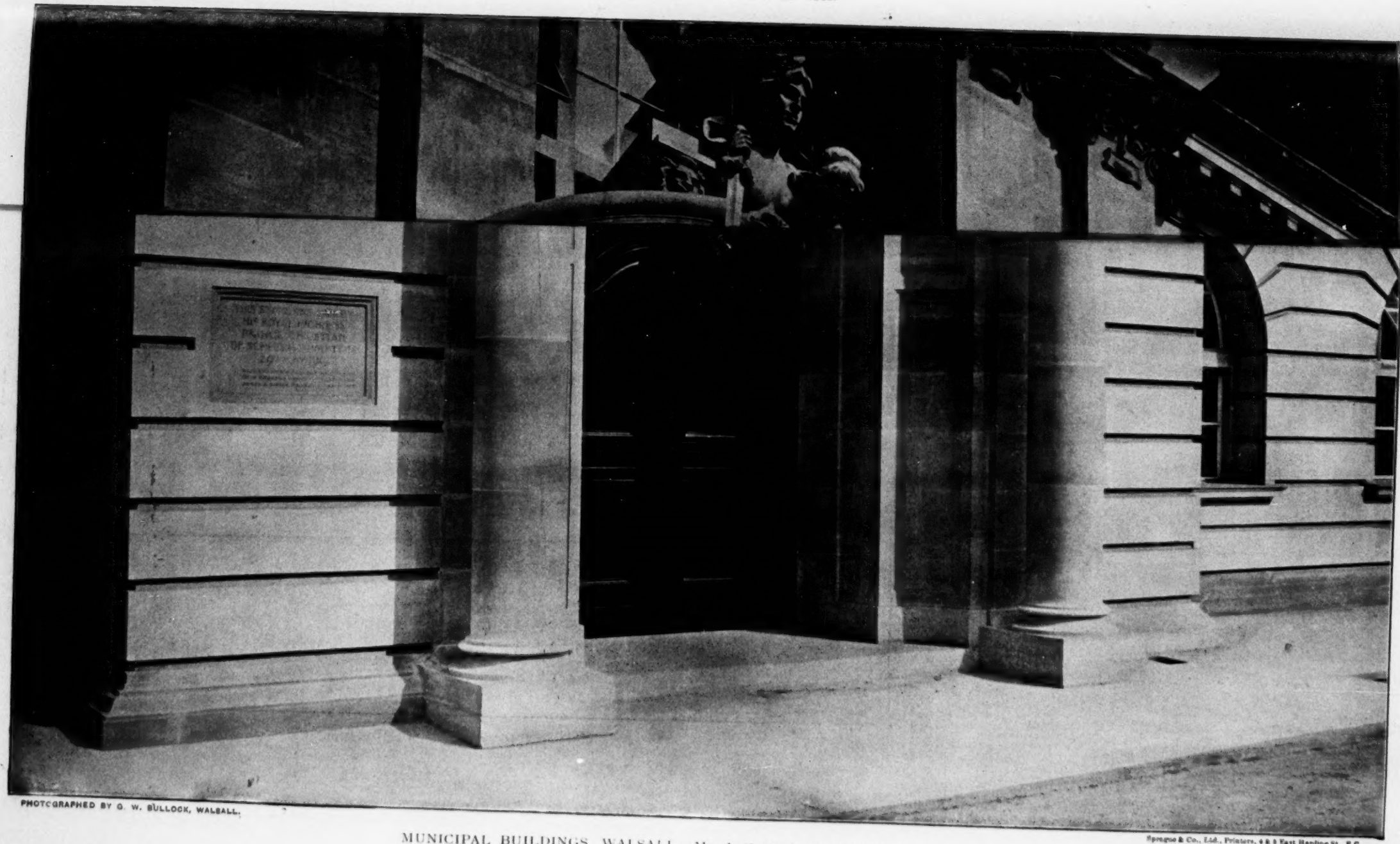
THREE of the churches shown in the illustration are now destroyed, viz.:—St. Mildred, Poultry; St. Dionis Backchurch; and St. Mary Staining. The tower of this latter is, however, still standing. The Church of St. Mildred, on its destruction, was taken to Thorpe Nab, Louth, with a view to its re-erection; at present the remains are to be seen where they were first put down. The Church of St. Benet is now used by a Welsh congregation.

THE BRITISH FIRE PREVENTION COMMITTEE.—The tests announced by the Committee for the next year are:—1. A test with a concrete floor supported by broad flange girders (provided by Messrs. H. J. Skelton & Co.), in which the cross girders are not fixed by cleats, bolts, or rivets. This test is in continuation of a similar test which was undertaken this session, but a different concrete aggregate is to be employed. 2. A test with a concrete floor with girder encasements (constructed by the New Expanded Metal Co.), in which the fire resistive qualities of the horizontal encasements are to be demonstrated.

THE BUILDER, OCTOBER 28 1905.



PHOTOGRAPHED BY G. W. BULLOCK, WALSALL.

MUNICIPAL BUILDINGS, WALSALL.—Mr. J. G. S. Gibson, F.R.I.B.A., Architect.

DETAIL OF MAIN ENTRANCE.

Sprague & Co., Ltd., Printers, 4 & 5 East Harding St., E.C.

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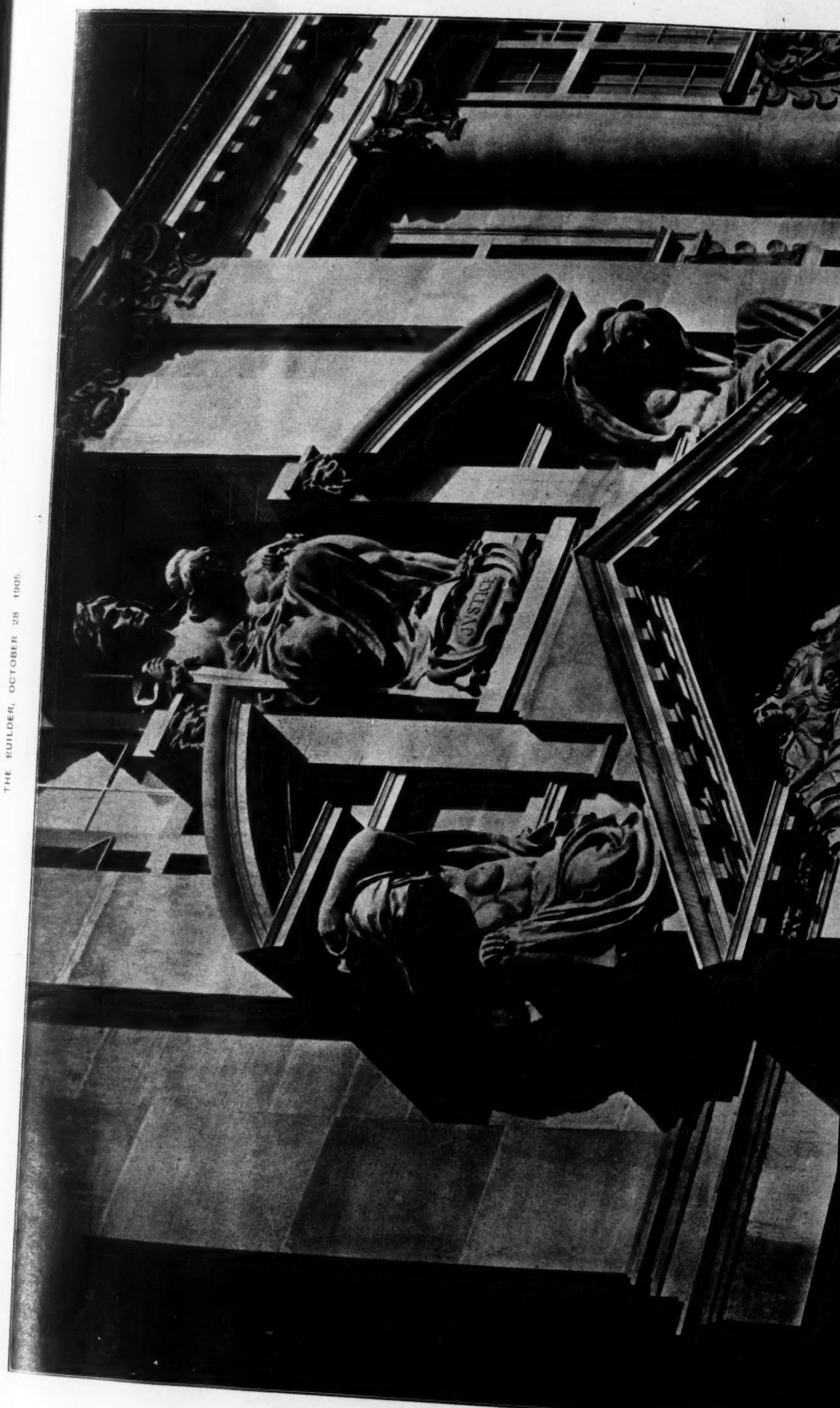

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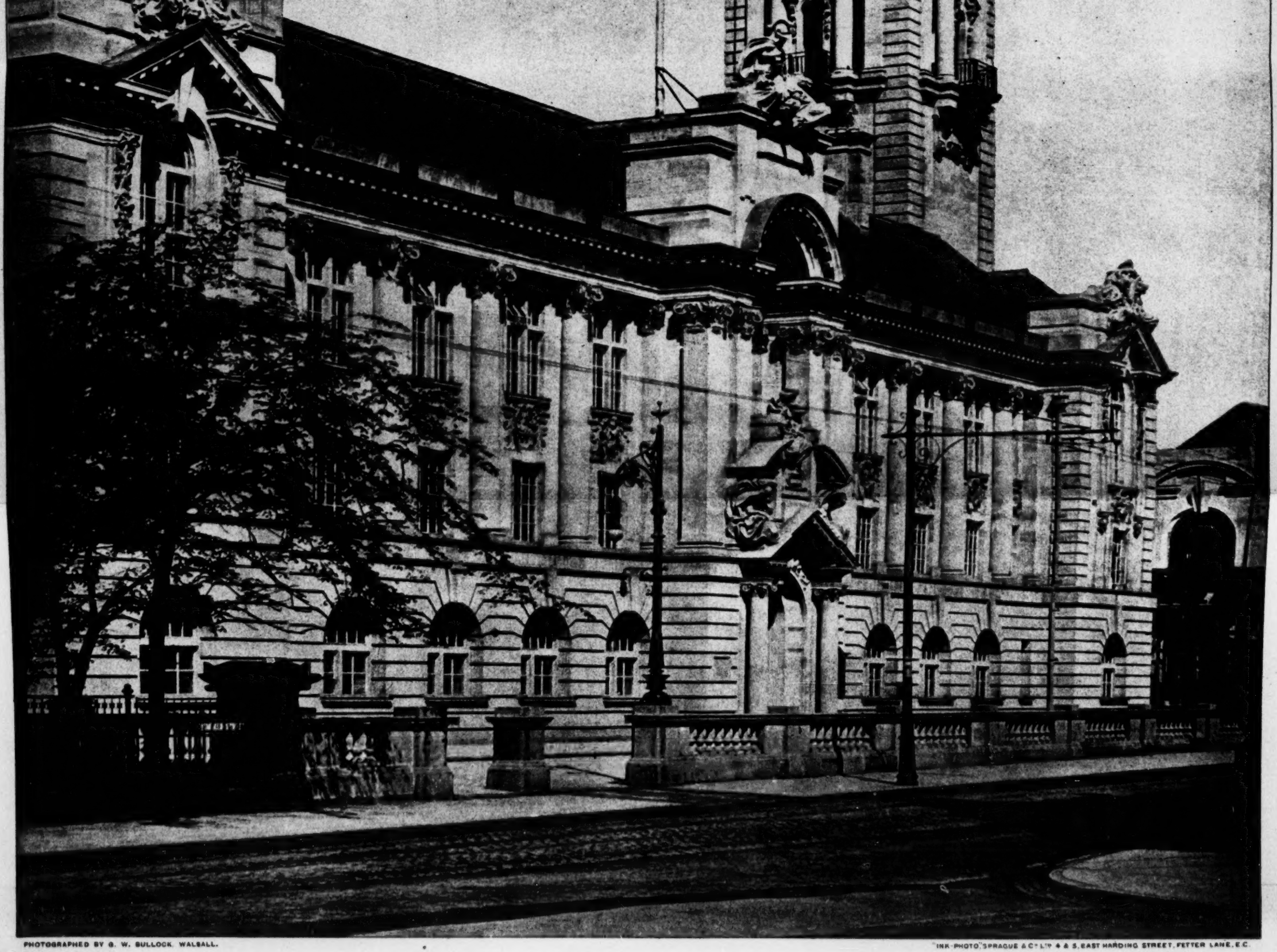

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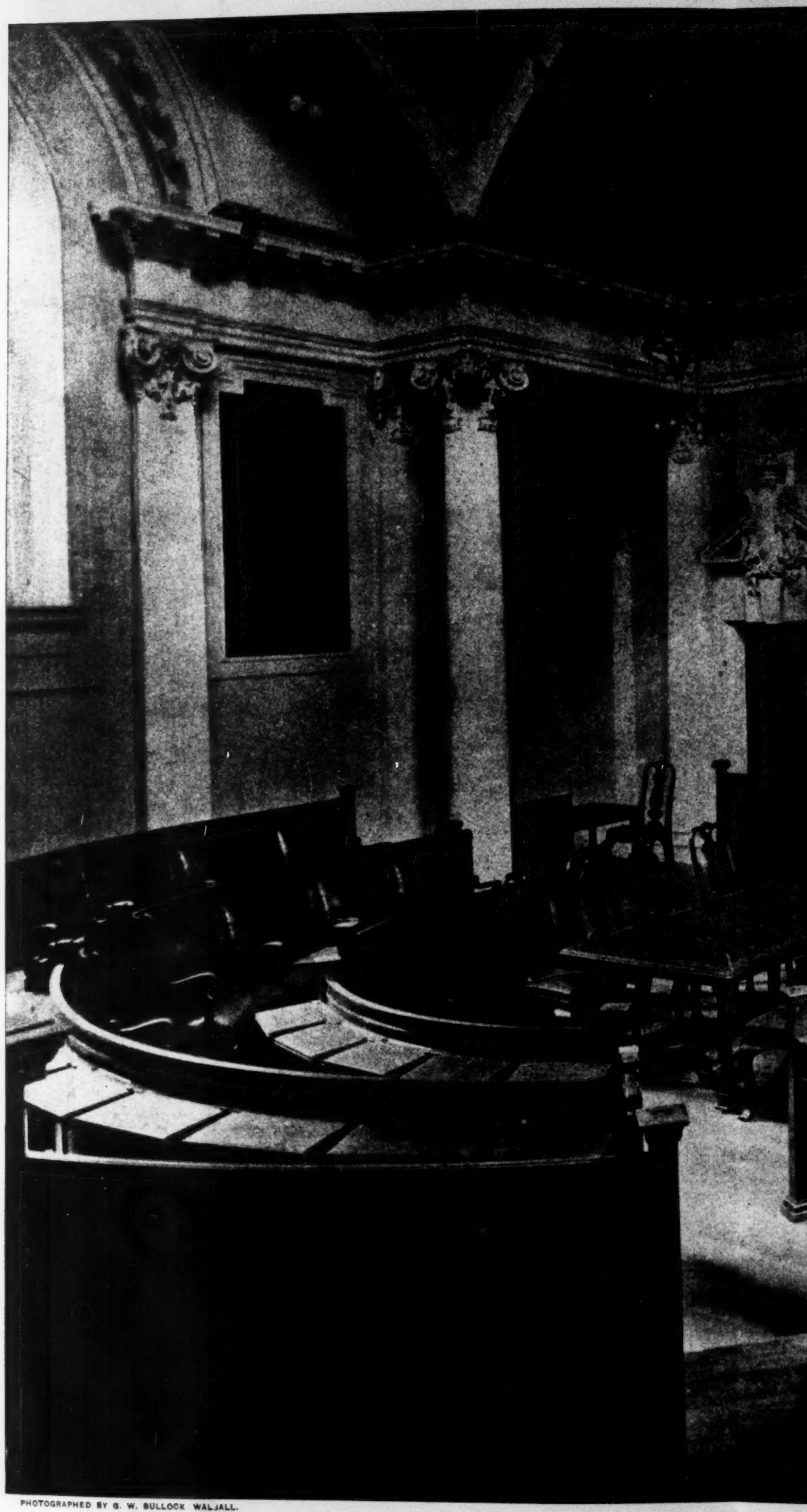
MUNICIPAL BUILDINGS, WALSALL.—Mr. J. G. S. Gibson, F.R.I.B.A., Architect.

GENERAL VIEW.



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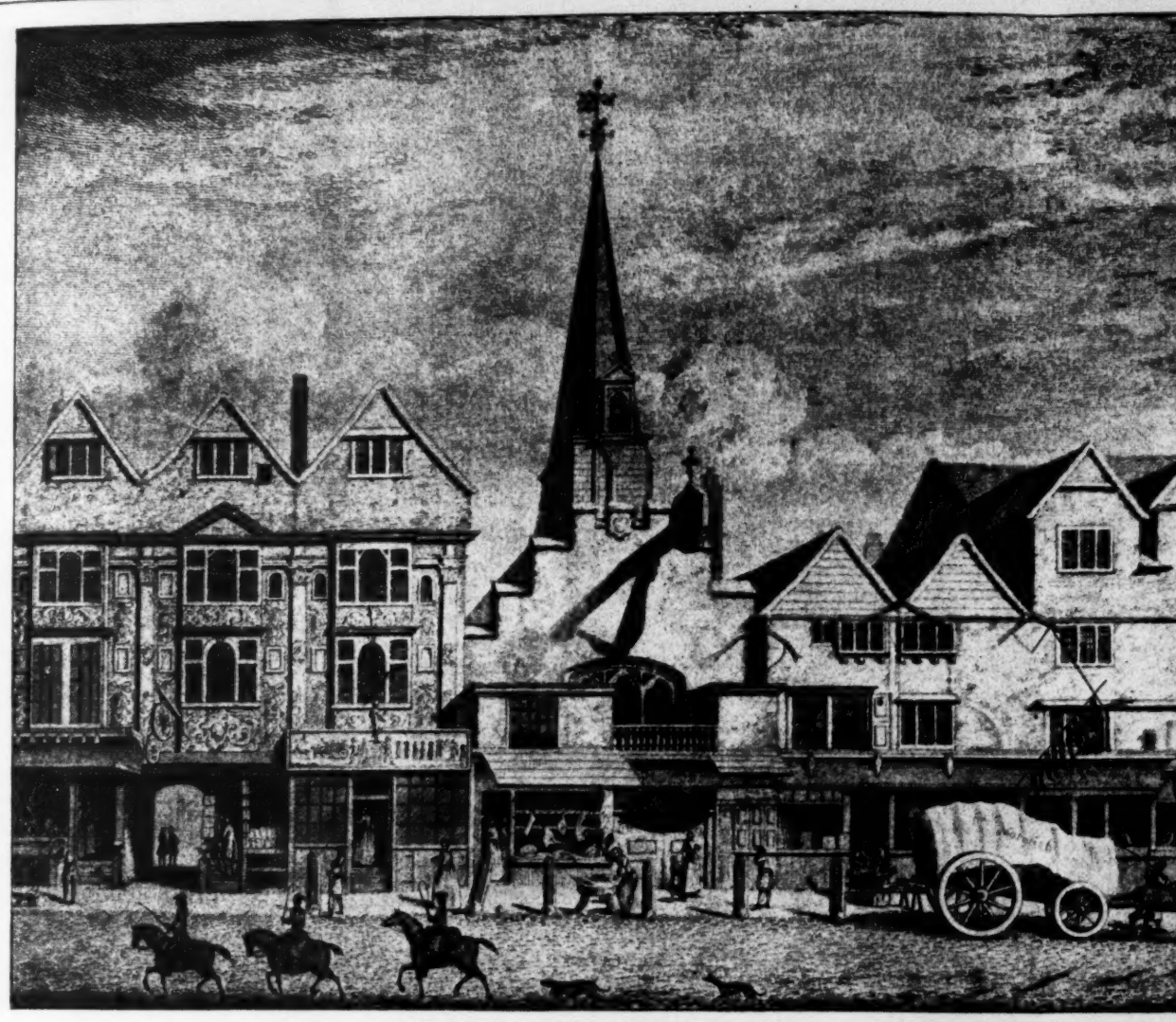
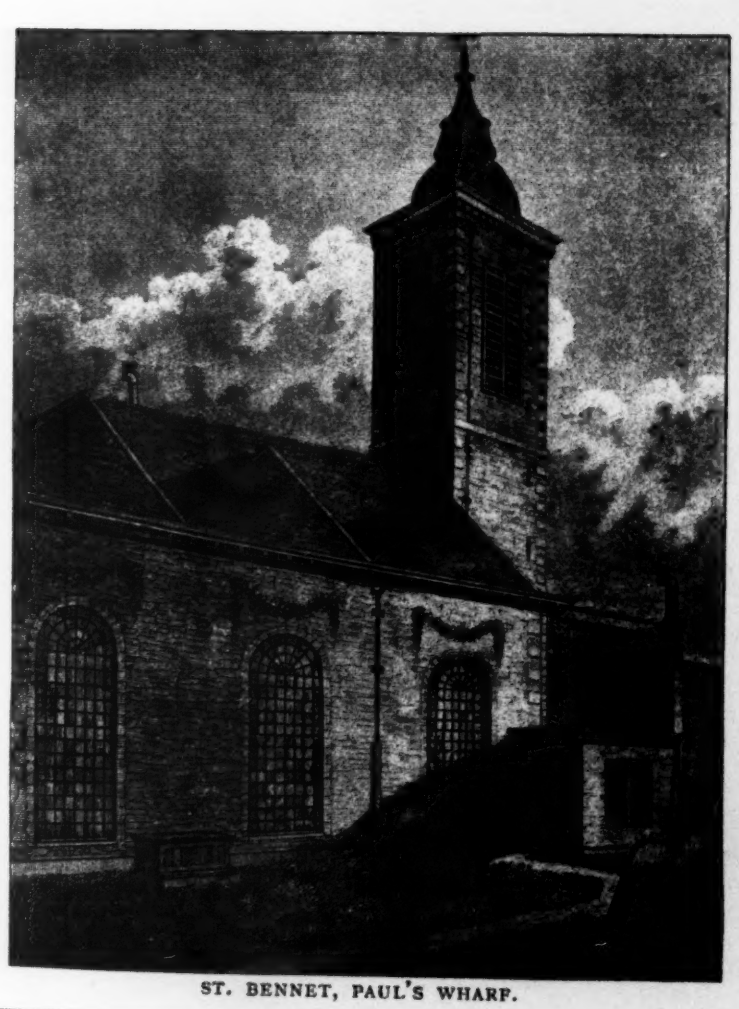
INTERIOR OF COUNCIL CHAMBER.



ST. ETHELBURGA, BISHOPSGATE, 1737.



ST. BENNET, PAUL'S WHARF.

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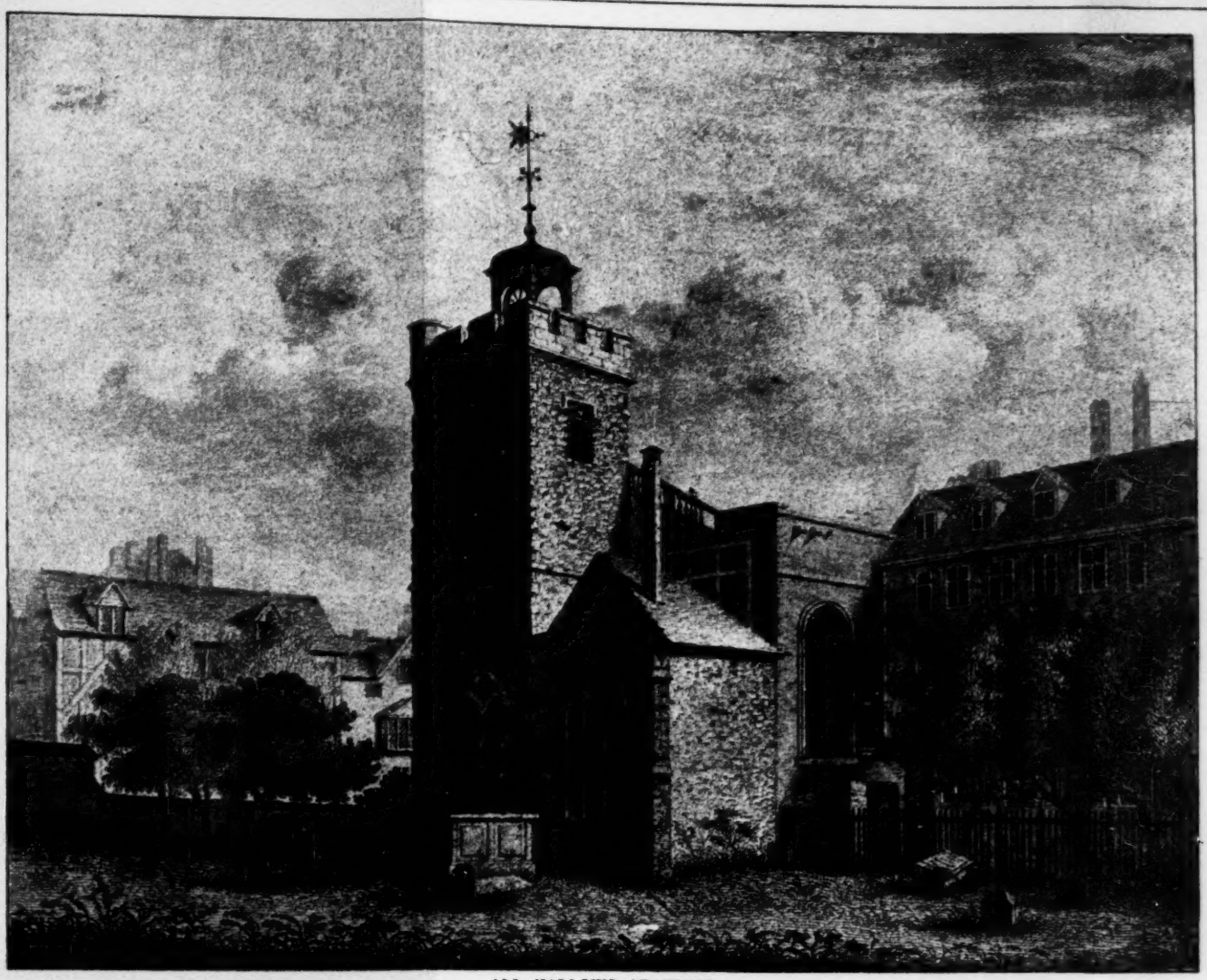

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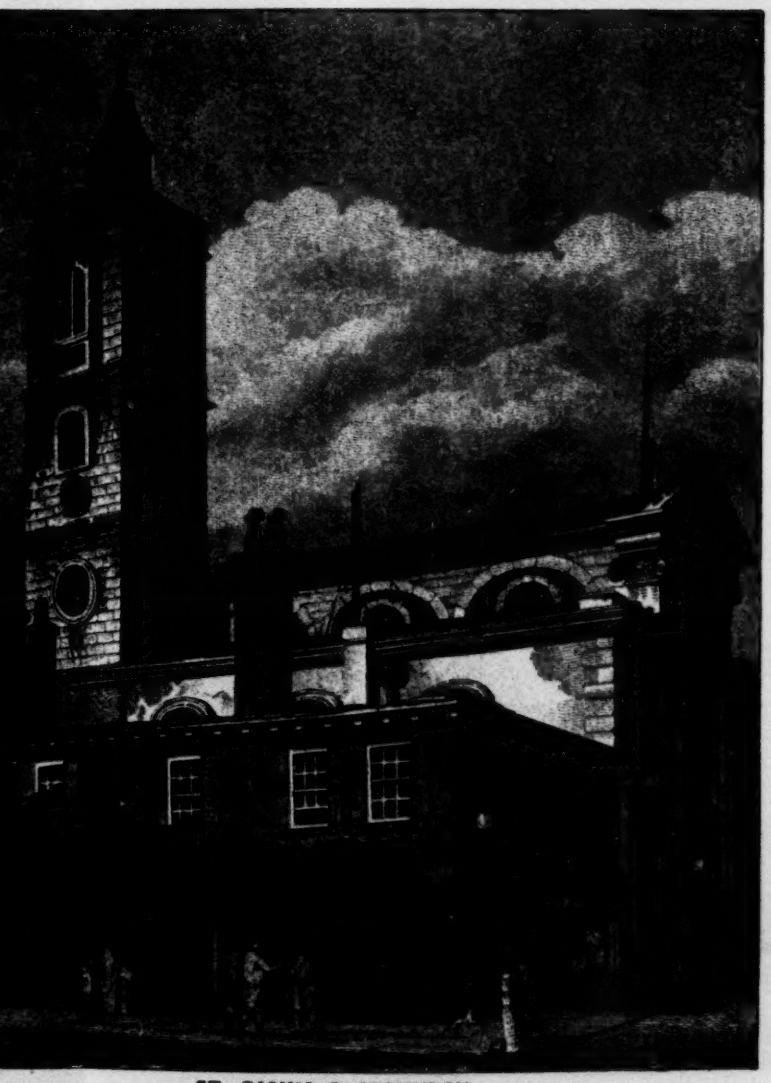

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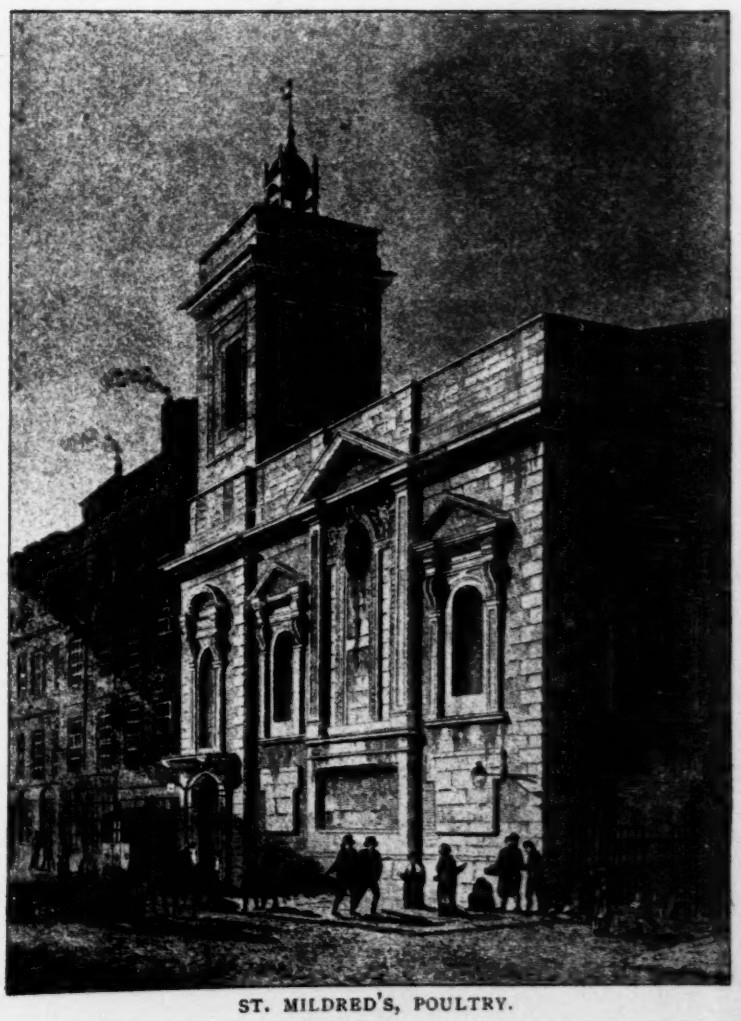

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URCHES: ILLUSTRATIONS TO PAPER BY Mr. ANDREW OLIVER, A.R.I.B.A.

THE INSTITUTE OF BUILDERS.

THE annual dinner of the Institute of Builders, Incorporated, was held on Wednesday last week in the Whitehall Rooms, Hotel Métropole, W.C., the President, Mr. Benjamin I. Greenwood, in the chair. There were also present, amongst others:—Sir Aston Webb, R.A., Mr. F. Higgs, President, London Master Builders' Association, and Messrs C. Barry, A. Boden, H. H. Bartlett, J. Bell, S. Bolton, J. F. Bull, A. Burnett-Burnett, F. S. Chesterton, W. Clarkson, F. L. Dove, A. Dixon, J. Dallow, C. Fitz-Roy Doll, W. H. Driffield, Basil Ellis, J. B. Gass, T. Gregory, Leslie W. Green, H. S. Greenwood, J. F. Greenwood, F. J. Gill, T. Holloway, Edwin T. Hall, J. S. Holliday, W. Higgs, G. S. Hill, H. H. Holliday, W. Hammond, G. C. Hudson, H. D. P. Kitcat, W. Lawrance, C. W. Latter, W. J. Locke, L. J. Maton, F. G. Minter, W. O. Milne, W. Nicholson, J. Randall, E. S. Rider, G. Sherrin, G. Gordon Stanham, C. J. Smithem, E. J. Stubbs, H. W. Trollope, W. W. Thomas, A. M. Torrance, S. Towse, A. W. Turnbull, C. Wall, B. C. Wotton, J. A. Wallis, F. E. Wallis, W. J. Wells, and W. W. Wills.

The loyal and patriotic toasts having been honoured (Mr. H. H. Bartlett proposing "The Imperial Forces" and Mr. Basil P. Ellis responding),

Mr. Edwin T. Hall, architect, proposed the toast of the evening, "The Institute of Builders and its President." He said that when we speak of building we refer to an industry which goes back to the beginning of civilisation. When nomadic tribes gave up their tents and settled in communities they erected permanent buildings, and then the craft of building was initiated. From the dawn of civilisation to the present day this great craft of building had existed, and not only were great buildings erected in England and Europe, but further afield great works were built thousands of years ago very much as they are to-day. If we looked at that marvellous palace of King Minos in Crete, erected, say, 4,000 years ago or more, we should see that in its construction the methods employed were almost identical with those employed to-day: staircases there had been constructed as we construct them; there were large and spacious apartments, indicating a marvellously complex system of administration; for no palace of to-day was more elaborate than that of King Minos of Crete. Then there were the great works erected in Egypt and further east in Ceylon, where we see that 200 years B.C. stupendous works were executed during a civilisation which has passed away. The great shrine of Buddha's Tooth—a huge domical structure in brick, in height 50 ft. more than St. Paul's Cathedral, and 360 ft. in diameter, on a base 600 ft. square—was built in an island, where to-day it was difficult to realise that builders of such a work could have existed. Then there were the wonderful works of Rome, where, in the great Augustan Age, magnificent palaces and temples were erected such as the world had not seen since. We had nothing to equal the great baths and temples of that city, and all these works were done by those who followed the calling which they represented! Each age had its great building operations. In this country, from the XIth to the XVth centuries, was the great era of church and cathedral building; then we came to the time when some of our noblest houses were erected, and to-day we have municipal building, town halls, hospitals, school buildings, and buildings for housing the working classes. There was one point of contrast to mention, and that was that in the past people worked with great deliberation: it was looked upon as a marvellous thing that Salisbury Cathedral should be erected in thirty years. At Durham the Chapel of the Nine Altars took 100 years to build. The key-note of the present day was concentrated executive energy—the intensifying, so to speak, of application, and that brought with it the spur to inventive genius—the bringing forth of labour-saving appliances so as to enable work to be done more rapidly. Time was, and must always be, given to the architect to mature a building design before it was started, but when once it was commenced everything was done to get it finished in the shortest time possible. All this demanded on the part of master builders an energy and an administrative executive skill which was equal to that shown by a general of an army in the field. To this business of building their hosts belonged, and it was the noblest of callings. As to the Builders' Institute, the masters had formed it, not for the purpose of offence or of fighting labour, but in order to deal with labour and other difficulties. They had in the Board of Conciliation brought themselves into close touch with the men, who had learnt that the masters were not their enemies but their friends, who desired to work in harmony with them. It was very necessary that they should have men of honour and credit at their head, and at the present time they had in their President such a man. As long as the Institute was controlled by such men so long it would prosper.

The President, in response, said that Mr. Hall had referred to the grandeur and magnificent stability of ancient buildings, and he (the speaker) had no doubt that buildings of equal strength and durability could be erected in the present day if the circumstances were equally favourable. On some previous occasion he offered to enter into a contract for the erection of a Pyramid in this country similar to those now standing in the land of Egypt, on two conditions, both of which, he believed, obtained when the ancient Pyramids were erected, namely, unlimited time and unlimited cost. Of course, he should require substantial payments on account, and the maximum retention would have to be limited to a very small sum. He thought he ought also to stipulate that bills of quantities should be supplied, because it would be such a delightfully remunerative job for a quantity surveyor. His offer, which was made some time ago, had never been accepted. As to the work of the Institute of Builders during the current year, they had received a proposal that clause 12A in the official form of Contract should be revised, and that, instead of reading—"Any error that may appear in the bills of quantities shall be rectified, and such rectification shall be a variation of the contract," it should read, "Any error or omission that may appear," etc., the reason for the proposed alteration being that the word "error" did not include the word "omission." This question arose in consequence of the peculiar judgment of Mr. Justice Channell in the case of Patman & Fotheringham *v.* Pilditch; but, as a matter of fact, he believed it was not so much the judgment itself as the comments made subsequent to the delivery of the judgment which produced the impression that, in the opinion of the learned judge, an omission was not an error. He should imagine that the learned judge had been misunderstood, although he knew that many were quite confident that the learned judge expressed the extraordinary opinion that an omission was not an error. In any case, it was a very interesting proposition. There was no doubt whatever that builders' omissions were reckoned as errors, and if, for instance, a builder were to omit a damp course he did not think there would be the slightest hesitation in condemning his omission as an error and compelling him to rectify it. If builders' omissions were errors, then surveyors' omissions were errors; that was to say, the word "error" covered omissions. He had heard some zealots for accuracy criticise the use of the word "appear" in this connexion, and ask the question, "Can an omission appear"? An omission could be obvious; it could be apparent, and it was not a great stretch of imagination to suppose that that which could be obvious and apparent could appear. Perhaps it would be as well to explain that he was the author of the clause in question, and they might then appreciate his zeal in defending it. When he first drafted the clause he used the words "be discovered," instead of "appear"; that was to say, "Any error that may be discovered," etc.; but that word seemed to him to suggest that as soon as a builder's contract was signed he immediately began diligently to search for errors in the bills of quantities, for the word "discover" implied search. He could assure them that that would be quite an erroneous inference, and he therefore substituted the word "appear." The Institute of Builders, however, in accordance with the request made to them, submitted a proposal to the Royal Institute of British Architects that the word "omission" should be included in clause 12A, and they received a reply which, in his judgment, was a very right and proper reply, namely, that there was no necessity whatever to alter the clause, as it was quite sufficient to cover the purpose intended; the clause therefore remained unaltered, and he ventured to think that if ever this clause should need to be interpreted in another law suit there should be no doubt that its meaning would be properly understood by any judge who gave the matter his careful attention, especially if proper evidence of the customs of the trade were brought before him. When bills of quantities were supplied to contractors it was, of course, for the express purpose of saving all the competitors for the contract the heavy expense of taking out the quantities themselves, the one measurement by the quantity surveyor serving for all. The contractors therefore all based their estimates on the bills of quantities supplied (the suggestion that the contractors should verify the bills of quantities was quite foolish, and could only come from one who was ignorant of what such a suggestion would involve). Reliance was placed on a quantity surveyor as a professional expert. If any item was omitted from the bills of quantities it followed, as a matter of course, that it was also omitted from the contractors' estimate, and that estimate was consequently less than it otherwise would be, and if this work omitted from the bills of quantities was subsequently carried out, then, if the bills of quantity were part of the contract, the cost of this item must obviously be added to the contract sum, otherwise the client would obtain that work without paying for it. On the other hand, if the quantity surveyor provided for excessive work which was not required, then the contract sum would, of course, be reduced accordingly, as the contractor should not be paid for work included, by direction, in his estimate and which work had not been done. When parties entered into a contract on these terms, indicated by a special clause (12A) inserted in the contract, any misconception, such as that implied by the learned judge's remarks, was inexplicable. When the bills of quantities were deliberately excluded from the contract, that was another matter. In that case the contractors consented to take the risk of inaccuracies in the bills of quantities; he took them "for better for worse, for richer for poorer," but the bills of quantities sometimes failed to realise expectations, whilst there were some rare cases when one got more than one expected. He disclaimed any inference that quantity surveyors were more liable to error than other men. "Humanum est errare." It was human to err, and surveyors were human. In the form of contract, however, it was not only inferred that surveyors might err, but architects also, for he remembered a certain clause which spoke of discrepancies which might occur between drawings and specifications which implied error, and also of stipulations that figured dimensions were to be followed in preference to scale, which also suggested error somewhere. With regard to builders, there was no attempt at a gentle insinuation, but it was evidently a foregone conclusion, without any hesitation or demur, that builders were not only liable to err, but that they probably would do so, and a large part of the contract was taken up in anticipating these errors and providing stern retribution. With regard to quantity surveyors, he should like to express the conviction that they were marvels of accuracy, considering the enormous obstacles to accuracy that they meet in their profession. When a client did not know what he wanted, and the architect did not know what he wanted, the surveyor would tell what they both wanted, and would put it down in black and white in such a clear and concise form that the builder was able to estimate for it. Of course, there were quantity surveyors and quantity surveyors, all assuming the same title but with very different qualifications; there were some whom he was about to call "amateurs," but he believed an amateur was one who did a thing for the love of it, and he could not conceive any human being taking out quantities for the love of it. He remembered once having what purported to be a bill of quantities placed before him which was a marvellous example of the way not

to do it; there were several items, such as, "Allow for water services," "Allow for such painting as may be necessary," and other clauses of that kind; but one particular item had impressed itself upon his memory; it ran as follows, "1 mahogany top," and he ventured to write to the gentleman from whom this so-called bill of quantities emanated to inquire what kind of mahogany top was intended—a peg top or some other kind of top. But these instances were, fortunately, rare, and he believed the weight and authority of surveyors' bills of quantities were becoming recognised every year to a greater extent, so much so that he believed in a few years' time that form of contract in which the bills of quantities were excluded would become obsolete. Even His Majesty's Office of Works, who for so many years adhered to this old custom, were now adopting the bills of quantities as the basis of their contracts. Parliament had been very busy during the current year, although it had done nothing; there was an art in being busy and doing nothing which found very competent exponents from the British workman up to the British legislature. There had been an abundance of legislation introduced, although, in most cases, it had fortunately led to nothing. There had been an attempt to amend the Workman's Compensation Act, which attempt had proved abortive, and the proposals would, in many cases, have increased the unfair burden that already rested upon the employer of labour. Some people thought that the Workman's Compensation Act was not capable of amendment; on the contrary, he thought it could be amended with very great advantage. It was undoubtedly a very desirable thing that when a workman met with an accident some provision should be made for the support of himself and his family during the time that he was laid aside. This would be, in the first place, a very great benefit to the workman himself; in the second place, it would be a benefit to the State, because it would prevent the wife and children of the injured man having recourse to the State for support. It was also suggested that some benefit would accrue to the employer of labour, although this was somewhat vague and difficult to discover, but let them assume for argument's sake that some benefit would accrue to the employer. Now, we knew that insurance against accident could only be effected by the payment of money, and he submitted that the workman, who received the greatest benefit, ought to pay something towards the cost; that the State, who also received benefit, should also contribute to the cost; and in that case he was quite sure that the employers would gladly contribute their share in order to effect the desirable result; but the Legislature had in its wisdom imposed the whole burden upon the employer, whether he liked it or not, and in this direction the Workman's Compensation Act was capable of considerable amendment by the equitable adjustment of the burden. He considered that workmen should be placed in a position to effect insurance against accident on terms infinitely more favourable than the rest of us, say, at one-third the ordinary cost, or even one-quarter, but to give them this benefit without any payment whatever was, in his judgment, a mistake; and the same objection applied to all those benefits which we desired to confer upon the poorer classes. Let them contribute something, however, small, to avoid the detrimental effect of making them the objects of charity. A Bill was also introduced into Parliament, entitled the "Trades' Disputes Bill," but it was very soon apparent that this could lead to no practical result. Mr. William Shepherd gave very valuable evidence before the Parliamentary Committee concerning this Bill, but, as they knew, the Bill died in its infancy. The chief work of the Institute, however, had been to contest the extraordinary Bill introduced by the London County Council entitled "The London Building Acts Amendment Bill," and in the efforts to oppose this autocratic measure they were joined by the London Master Builders' Association, the Institute of Architects, and the Institution of Surveyors, and other public bodies, as well as private individuals, also offered determined opposition to the measure. The Institute opposed the Bill in conjunction with the London Master Builders' Association, and it had cost about 700*l*., and there was no doubt that the other bodies opposing the Bill spent as much, if not more, in their opposition. They petitioned against the Bill for reasons which appeared to be overwhelmingly conclusive, and Mr. William Shepherd gave evidence in support of their views before the Parliamentary Committee, and he should like to call attention to the very valuable services that Mr. Shepherd had frequently rendered to the trade in this direction. He was a man who had very clear and decided views as to what might be considered fair and just, and when he expressed these opinions in his deliberate manner they generally carried conviction with them. There was no member of the Institute who rendered more valuable services in this direction than he. The Bill was dropped, with the exception of the "Fire Clauses," containing most arbitrary and onerous restrictions upon owners of property and the building trade. They opposed, not the fire clauses, but the oppressive provisions contained in these fire clauses, both in the House of Commons and in the House of Lords; but the Bill was rushed through at the tail end of the session and became law. They obtained, however, one very valuable amendment, in addition to two or three minor amendments; the important amendment was the insertion of a "right of appeal," or, as the builders would call it, an "Arbitration Clause," for in drafting the Bill the London County Council asked for unlimited powers to enforce their own requirements without restriction and without giving any proper reason for their decisions. If there be one thing more than another that created enmity against the London County Council it was their autocratic and dictatorial attitude towards those who were entitled to their consideration. When democracy once got into power it seemed to act in a much more autocratic and domineering spirit than was ever exercised by the aristocracy. He was quite sure that in securing the right to appeal they had secured that which would prove to be of great ultimate value to the community. It was proposed to present a petition to His Majesty that a Royal Commission be appointed to consider the various London Building Acts for the purpose of revising and combining them in one Act which should at once be comprehensive and comprehensible, for he thought they would agree with him when he said that it would tax the abilities of the proverbial Philadelphian lawyer to grasp the intricacies of the Building Acts as they now exist. There was one matter to which he intended to refer at the outset of his remarks, *i.e.*, to the recent decease of Colonel Stanley Bird, whose name was so well known by all connected with the building trade. The valuable services that he rendered to the trade in years past would not easily be forgotten, and they would be glad to hear that it was proposed to establish some permanent memorial to him. Colonel Bird was greatly interested in the work of St. Mary's Hospital, and it was proposed to endow a cot in that institution in his memory. Colonel Bird was intimately associated with the Institute of Builders, the London Master Builders' Association, the National Federation of Master Builders, and the Builders' Accident Insurance Co., and it was suggested that all these bodies should participate in this memorial. A circular would shortly be issued inviting contributions, which he felt sure would be readily forthcoming. At this gathering, representative of the London building trade, some reference might well be made to the excellent work that had been recently accomplished by the President of the London Master Builders' Association in the readjustment of the hours of labour during the winter. Mr. Frederick Higgs had expended very much time and energy to effect this result, and in the conferences with the various trades unions he had exhibited a tact and discretion which had contributed in no small degree to the successful result. He was not yet through with the task he had taken in hand, and perhaps the most difficult problem was yet to be solved, but he (the speaker) was sure they wished him every success in his endeavours to complete the useful work he has undertaken.

Mr. Fredk. Higgs, President of the London Master Builders' Association, then proposed the toast of "The Architects and Surveyors."

Referring to the alteration in the working rules, he said they had been fortunate in hitting on the right time to propose the alterations, and to that was to be attributed the success of the operations so far. He did not think that in the days of old there were general contractors, and whether there were architects he did not know, though he fancied that the architect was the master builder, *i.e.*, that the man who conceived the scheme was the man who managed the carrying of it out; but the exigencies of present-day life, and the convenience to the architect of having such a man to deal with, had brought into existence during the last 100 years or so the general contractor, who was termed the "undertaker" in the Workmen's Compensation Acts. Those engaged in the trade were each dependent on the other. The architect was the brains of a scheme; the contractor might be called the heart; and below him were the workpeople, who might be called the nerves and muscle. It would be absurd of one to say to the other, "I have no need of you." They were indissolubly bound together in one community of interest. Amongst the architects of to-day were men of great ability, and the opportunities for the exercise of their skill and ingenuity were never greater than they are to-day, though probably, if only a small part of the recommendations of the Traffic Commission were carried out, there would be greater opportunities in the future. Every street improvement meant opportunities for both architects and builders. With the toast he coupled the names of Sir Aston Webb, R.A., and Mr. Walter Lawrance.

Sir Aston Webb, in reply, said that their interests in common were so great that it would be extraordinary if they did not work together in amity, and he thought that they were never on better terms than they were to-day. He desired to associate himself and all architects in what had been said by the President as to the late Colonel Bird. He (the speaker) met him often, and had opportunities of realising how wise and sagacious he was—a man of cool judgment and fairness—and they all regretted that his time to go had come. He (the speaker) had the good fortune to be associated with their President in the erection of a great national building, and he congratulated him on occupying the position he did that night. As to what the President said about the Pyramids, he (the speaker) had no doubt that if Mr. Greenwood had the opportunity of building such a work, he would build an excellent Pyramid, every bit as good as the existing one. Great admirer as he was of old work, he was an equal admirer of the present, and if we were to make progress we must look forward rather than backwards. The building trade and building work one had every reason to be proud of, and every reason to believe that they would progress, and that works would be produced equal to what had gone before. Sometimes he thought that it would be well for building generally if architects and builders could confer together a little more in regard to many matters—as to the use of materials, matters of construction, etc. He thought it might result in keeping specifications closely up to date, and would help them to understand what they required and what they intended to do. London seemed to be rebuilding, and yet he heard on all sides that the building trade in London was in rather a depressed state; and there was a cry from the public for increased cheapness in all buildings and for greater rapidity of construction. He ventured to think that neither cheapness nor rapidity was to the advantage of good building or design. He thought they should try and make the public understand that; because a thing cost less money, it was not necessarily cheap. He was inclined to think that the 150*l*. cottage was dearer than the 200*l*. cottage; but, on the other hand, he thought they should try to economise where they could. He believed that cheap materials were a mistake, but economy they might more closely go into—the economical use of materials, economical construction and labour-saving contrivances. In regard to rapidity of workmanship, there had been most alarming operations in London within the last eighteen months or two years. He looked upon it all with the greatest possible alarm, and he was astonished to see the buildings that were put up in six or nine months. He did not think

that such rapidity could be good for building, and he hoped that they, who had so much influence in the matter, would not take to that system of building. It was not good for the building itself, and it was bad for the design. These experiments from across the Atlantic were apt to be taken up, and if people got the idea that certain buildings could be built in, say, six months, they would never give longer time. When people pressed him to get on quicker, he always said: "When your building is finished, if all you have to complain of is the time it took to build, I shall not mind." He did not believe that we ought to hurry such things so much. They were all engaged in one of the noblest of crafts, and no one was more proud to belong to it than he was. If it was a worthy ambition—and he supposed it was—that when we leave this world we shall leave some little mark behind us, there was no occupation which lent itself so well to that ambition as the erection of buildings. But that advantage carried with it a great responsibility. He did not think that Shakespeare referred to builders and architects when he said that "the evil that men do lives after them," but he might have done so, and one knew that errors of design and errors of construction which they all sometimes made would in due time come home to roost. The mills of time grind slowly, but they ground exceeding small, and if we did not see the result our successors did. Let us all try, that our descendants may say of our designs and work, as we said of our ancestors: "They dreamt not of a perishable home who thus could build."

Mr. Walter Lawrance, President of the Quantity Surveyors' Association, who responded for the surveyors, said that the President had mentioned one very important matter, *i.e.*, Clause 13A of the Building Contract. As the surveyor in the case which the President mentioned, he must utterly disagree with him as to his satisfaction with the decision of the Royal Institute of British Architects. He felt most strongly that that clause ought to be altered. The decision of Lord Justice Channel simply amounted to this: That if the surveyor left the total quantity of an item—say, the whole of the floor of a building—out of his bill of quantities, the builder had no claim; but if the surveyor should happen to take twenty squares where he ought to have taken 200, then the builder had a claim. He could not see how the contractor could be satisfied with that. But he quite agreed with the President's remark there were surveyors and *surveyors*, but he looked to both architects and contractors to uphold the position of surveyors. The amount of advertisement and competition at the present time was bringing in men who, he was sure, contractors would be sorry to have to deal with as quantity surveyors, and would give rise to endless trouble in the future owing to the bad quantities which they would prepare. There were men who prepared quantities at a very reduced rate—at a rate which experienced quantity surveyors knew it was impossible to do the work at properly.

Mr. Chas. Wall then suitably proposed the last toast, "The Visitors," coupled with the name of Mr. G. Lee. In referring to the fire clauses of the London County Council Building Act Amendment Bill, he said that those clauses would increase the work of London builders immensely. If the President had to build a Pyramid, he was afraid he would not live to see it completed.

Mr. Lee, of South Africa, in response, said that it had been the aim of the architects and surveyors and builders of the colonies for years past to work on the lines of those at home, and in considering what should be done in the colonies they considered what had been done at home. It was the desire of every architect in South Africa who aspired to rise in his profession to become a member of the Royal Institute of British Architects. He had known men who had handed over their work to others so as to return to England to study and pass the examinations of the Royal Institute of British Architects. Quantities in South Africa were formerly drawn up in a very primitive and loose way, but quantities to-day in South Africa were prepared in much the same way as they were in England. Trade in South Africa was very depressed at the present time, but in the Transvaal things were brightening up a little.

The President said he should like to refer to what Mr. Lawrance had said. He did not think there was any difference of opinion between them, and if the judgment referred to was the last word to be said on the subject, he admitted that some alteration should be made in the Contract; but he was loath to believe that any such judgment could stand permanently or form a precedent, and it was because he held that opinion that he thought the alteration was unnecessary. As to Mr. Wall's remark about the Pyramid, it would not matter if he did not live to complete it, so long as the payments on account were made.

The proceedings then terminated.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Islington, South.—A projecting pilaster between Nos. 58 and 59, Upper-street, Islington (Messrs. F. Sage & Co., Ltd., for Messrs. Jones & Sons).—Consent.

Greenwich.—Detached houses on the east side of Mycenæ-road, Westcombe-park-road, Greenwich (Messrs. Crickmay & Heath for Mr. W. C. Johnson).—Consent.

Lambeth, North.—Projecting clock at the Royal Victoria Hall, Waterloo-road, Lambeth (Messrs. J. Walker, Ltd.).—Consent.

Paddington, South.—An iron and glass conservatory at the first floor level in front of "Keith House," Bayswater-road, Paddington (Mr. E. C. Macpherson for Sir Clifton Robinson).—Consent.

St. George, Hanover-square.—A projecting balcony at No. 27, Maddox-street, St. George, Hanover-square (Mr. E. K. Purchase).—Consent.

Wandsworth.—Porches to ten houses on the west side of Luttrell-street, Putney (Messrs. E. H. Wallis & Co.).—Consent.

Westminster.—That the application of Mr. P. N. Ginham for an extension of the periods within which the erection of an addition, with a projecting portion, to the Westminster Technical Institute, Vincent-square, Westminster, was required to be commenced and completed, be granted.—Consent.

Clapham.—Buildings on a site abutting upon the south side of Clapham Park-road and the east side of Park Hill, Clapham (Wandsworth Borough Council).—Consent.

Islington, West.†—The erection of a one-story office building on the south-west side of Holloway-road, Islington, adjacent to the west side of the Great Northern Railway Station (Mr. V. F. V. de Brauwere for Mr. H. E. Butcher).—Refused.

Hackney, South.—Buildings on a site abutting upon the east side of Urswick-road, south side of Lesbia-road, and north side of College-avenue, Hackney (Mr. J. G. Tewson for Mr. D. Burnett).—Refused.

Lewisham.—One-story shops on part of the forecourts of Nos. 29 and 31, Beacon-road, Hither Green, Lewisham (Mr. H. Kent).—Refused.

Width of Way.

Islington, West.†—A building on the site of the tramways depot on the north-eastern side of Warlters-road, next Camden-road, Islington, with external walls at less than the prescribed distance from the centre of the roadway of Warlters-road (Mr. E. J. Edwards for the Highways Committee of the Council).—Consent.

Width of Way and Lines of Frontage.

Fulham.—Buildings upon a site, abutting upon the southern side of Fulham-road, western side of Fulham Park-road, and eastern side of Landridge-road (Messrs. Withers & Meredith for Messrs. Spencer, Santo, & Co.).—Refused.

Lines of Frontage and Construction.

Fulham.—A cycle and tool shed at No. 38, Doneraile-street, Fulham, to abut upon Woodlawn-road (Mr. C. Botterill for Mr. G. Williams).—Refused.

Width of Way and Construction.

Southwark, West.—An iron shed on a site abutting upon the north side of Lavington-street and south side of Farnham-place, Southwark, with the forecourt boundary at less than the prescribed distance from the centre of the roadway of Farnham-place (Messrs. F. Wheeler & Son for Messrs. Measures Brothers, Ltd.).—Consent.

Space at Rear.

Strand.—A deviation from the plans approved for the rebuilding of Nos. 85 and 86, Jermyn-street, and Nos. 10 and 11, Ormond-yard, St. James, so far as relates to the erection of small buildings in the yard at the rear of the Waterloo Hotel (Mr. G. D. Martin).—Consent.

Bermondsey.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of St. Stephen's Vicarage, St. Stephen's-square, Southwark (Mr. J. W. Rhodes for the Rev. W. Dodge).—Refused.

Alterations of Buildings.

Camberwell, North.—The retention of a water-closet building and reconversion into a dwelling house, of a stable building at the rear of the "Duke of Clarence" public house, No. 181, Camberwell-road, Camberwell, abutting upon New Church-road (Messrs. F. J. Eedle & Meyers for Mr. A. E. Garrard).—Consent.

Strand.—Alterations at No. 7, Noel-street, Soho (Mr. G. C. Lambert).—Refused.

Working-class Dwellings and Space at Rear.

Stepney.—Blocks of intended dwelling-houses to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site on the southern side of Adelina-grove, Mile End (Mr. W. E. H. Crawley for the Mercers' Co.).—Consent.

Stepney.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of workshops, stables, and two blocks of dwellings on a site on the southern side of Adelina-grove, Mile End, with open spaces at the rear (Mr. W. E. H. Crawley).—Consent.

Means of Escape at Top of High Buildings.

Strand.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, on the seventh (top) story of Nos. 1 and 1A, Cockspur-street, Strand, for the persons dwelling or employed therein (Mr. H. Tanner, jun.).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—On the 17th inst. Mr. Ernest Marriage read a paper on "The Sculptures of Chartres Cathedral," illustrated by a unique collection of lantern slides, which, for their technical excellence, it would be hard to beat, many of the negatives being taken by aid of the telephoto lens. The paper chiefly described the various sculptures and their representation. The south porch, which was finished in 1170, and is considered one of the finest in France, consists of three bays, each with a pediment containing niches, above being a gallery of large statues, the whole representing the "Glorification of Christ." The north porch, which is also a mass of symbolic carving and enrichment, is devoted to the "Glorification of the Virgin," and contains seven hundred statues; round the soffits of the arches are various figures representing the Creation, while under other arches there are figures representing the months of the year and signs of the Zodiac, although some of them are misplaced, probably owing to the many restorations the cathedral has undergone from damage by fire. In nearly all cases it is comparatively easy to make out their meaning, thereby showing the wonderful state of preservation. On some of the sculptures there are still traces of gilding and colour. Mr. Wonnacott, in proposing a vote of thanks, mentioned that he thought the carving to some of the bases was rather Renaissance in feeling, and seemed to be of a later date than the rest of the work.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—The Green Book of the Birmingham Architectural Association gives a very good account of the prospective arrangements for the coming session. Among the papers to be read at the sessional meetings is one by Mr J. A. Gotch on "The Homes of Queen Elizabeth's Courtiers"; Mr. Percy S. Worthington contributes one on "Homes of the Monks during the Middle Ages"; Mr. Lanchester one on "The Cardiff Municipal Buildings"; Professor Beresford Pite one on "Architectural Effect in Cities." The visit of the Association to France is commemorated by three or four interesting sketches of Mont St. Michel and Coutances. The B.A.A. studentship prize is offered for the best set of sketches and measured drawings made under certain specified conditions, and for the best design for a cottage hospital, the directions for which are very clearly and fully set forth. Mr. Bidlake's lectures on "Architectural History" at the School of Art, from Roman Architecture to the Gothic Style in England, will be of interest and

value to students. It is noted that Mr. Alfred Gilbert, R.A., and Sir Aston Webb, R.A., have become honorary members of the Association. In the course of the Report is the following rather drastic comment in regard to the subject of Fellowship elections at the Institute :—

"The Council have held eight meetings—one of the most important questions receiving their attention being the procedure of the R.I.B.A. Council in its elections to the Fellowship. It has been felt pretty generally, not only by our own, but by other affiliated Societies, that the R.I.B.A. Council exercises no efficient discrimination as regards the qualifications of applicants for direct admission to the Fellowship, who desire to escape the test of the qualifying examination imposed upon all new Associates. By its own regulations the Institute is required to consult the Local Societies with regard to such applicants within their respective provinces, but those regulations have been practically disregarded, and, what is worse, the recommendations of the Local Societies have been ignored when the attention of the R.I.B.A. Council had been drawn to the point at issue. The Council of the Institute, therefore, drew down upon themselves the adverse vote which in some cases nullified their nominations for the Fellowship."

We print this as an expression of opinion, though we think the Council of the Association, in admitting this paragraph, must be rather under a misapprehension both as to facts and as to the feelings and intentions of the Institute Council. The other side of the question is stated in a communication to the Institute *Journal* by Mr. Brodie, which will be found reprinted on page 443 of this issue.

The following is the list of officers for the new session: — President — Mr. Thomas Cooper; Vice-President—Mr. J. L. Ball; Council — Messrs. H. T. Buckland, Arthur Harrison, W. Henman, Alfred Hale, A. E. McKewan, E. F. Reynolds, and E. L. Percival; Hon. Treasurer—Mr. Edward Hale; Hon. Librarians—Messrs. J. A. Swan and E. H. Worsey; Advisory Committee—Messrs. J. L. Ball, W. Hale, Arthur Harrison, W. Henman, Herbert Martin, F. B. Osborne, and Anthony Rowse; Hon. Secretary to Advisory Committee—Mr. J. C. Nicol; Lecturer at the School of Art—Mr. W. H. Bidlake; Teachers at the School of Art—Messrs. H. T. Buckland, E. F. Reynolds, and F. B. Andrews; Hon. Secretaries—Messrs. Gerald McMichael (105, Colmore-row) and A. Dennis Thacker (33, Newhall-street).

SHEFFIELD SOCIETY OF ARCHITECTS. — The opening meeting of the session of the Sheffield Society of Architects and Surveyors was held on the 19th inst. in the General Lecture Room of the Sheffield University, when an address was delivered by the President of the Society, Mr. Edward Holmes, A.M.I.C.E. Mr. E. M. Gibbs occupied the chair. Mr. Holmes referred at the outset to the progress of the Society, and compared the position with that at the end of the first year of their existence, in 1888. The Society then had forty-seven Fellows, twenty-six Associates, and five students, whilst the last report showed thirty-seven Fellows, forty-eight Associates, and fourteen students, a net increase of twenty-one. The results of the competitions during the yast two years were rather disappointing. During the seasons 1903 and 1904, only two prizes were awarded, the essays in the other not being considered of sufficient worth to merit recognition, whilst during the seasons 1904 and 1905, out of four competitions, the prize was only awarded in one case. The lectures had been of an excellent character, but there was room for improvement, both in regard to the attendance and the discussions which ensued. The President went on to refer to the housing question, and dwelt upon the much-talked-of "Garden City" schemes. In his opinion many of the schemes which had been formulated were chimerical and impracticable, but that should not prevent them thinking deeply on the subject. Their ideals could not be too high. He impressed upon all the members the desirability of making themselves acquainted with the powers already possessed by municipalities upon the subject, so as to enable them to consider in what way they could be amended or enlarged. The question was intimately connected with the proposed new building by-laws, and the Council of the Society would closely bear this in mind when they were approached by the City Council on the subject, as they would be in due course. Whatever their individual opinions might be, the subject was bound to come more and more to the front, and he advised the younger members to seriously take up this question of cheap sanitary cottages, which, he was sure, they would find a profitable one. Another question which was worthy of their closest attention was the acquiring by municipalities of open spaces and land in the neighbourhood of large towns. The departure taken by the City Council at their last meeting, when they approved of the acquisition of land along the Rivelin Valley for the purpose of opening out the valley by the construction of a road, so as to provide profitable employment for the unemployed, was, in his opinion, but the commencement of similar action on a large scale by municipalities. It was also intimately connected with the housing question. Mr. Holmes proceeded to comment on the subject of street dedication. The existing rule-of-thumb system of street dedication was, in his opinion, tending to cripple and narrow the dealings in land, to render very difficult the procuring of mortgages, and thus to raise the price of buildings and the rents of small houses. They felt it their duty to take up a strong position on the matter, and most careful consideration was given to the subject, not only by the Council of the Society, but by a Special Committee of Surveyors who were asked to draw up a report, which was afterwards submitted to the Special Committee appointed by the City Council. Local and Imperial taxation, the law as to rights of light, and the question of education were also touched upon by the President, who, in conclusion, appealed to the members, especially the younger ones, to aim high. As professional men, let it be their aim to attain the highest qualifications for their calling, an aim which, if properly persisted in, could only result in happiness and satisfaction to themselves and the appreciation of their fellow-citizens. At the conclusion of the address a hearty vote of thanks was passed to the President, on the motion of the Chairman, seconded by R. W. Fowler, and supported by Messrs. Joseph Smith, T. Winder, G. Osborn, and J. R. Wigfull. The following new members were elected:—Fellow, Mr. F. Cartwright; students, Messrs H. Green and F. N. D. Masters.

GLASGOW ARCHITECTURAL ASSOCIATION.—The first meeting of the session was held in the rooms, Pitt-street, on Wednesday last week, when Mr. James Lochhead, A.R.I.B.A., delivered his presidential address. The lecturer's remarks were submitted under the title of "Generalities," and dealt with the problems and difficulties of modern practice, the solution of which was not to be found in text-book or college. The present contemplated scheme of amalgamation between the three architectural bodies in Glasgow would, if carried through successfully, incline not only to the advancement of the profession artistically, but by increased facilities for the interchange of ideas result in the curing of certain grievances which require redress. The practice of architecture has never involved more difficulties than at the present time, and the architect, young and old, has to encounter a multitude of problems in the course of his work which might be solved by the greater unity of such a body. The lecturer, in concluding an interesting address, pointed out some of the avoidable pitfalls that lie in the path of the youthful aspirant to architectural honours. A hearty vote of thanks was accorded Mr. Lochhead for his remarks.

BOOKS RECEIVED.

MOTOR VEHICLES FOR BUSINESS PURPOSES. By A. J. Wallis-Tayler, M.Inst.C.E. (Crosby Lockwood & Son.)

THE MECHANICAL WORLD POCKET DIARY FOR 1906. (Emmott & Co., Manchester. 6d.)

TRUTH, WIT, AND WISDOM: 525 Letters to the Press, 1887-1903. By Algernon Ashton. (Chapman & Hall. 6s.)

THE USE AND CARE OF CHAINS FOR LIFTING AND HAULING. By Henry Adams, M.Inst.C.E. Second Edition. (Published by the author. 1s.)

THE LAW ON LIGHT AND AIR. By Alfred A. Hudson and Arnold Inman. Second Edition. (Sweet & Maxwell. 6s.)

HYGIENE. By J. Lane Notter and R. H. Firth. Sixth Edition. (Longmans, Green, & Co. 4s. 6d.)

THE LAW AFFECTING SEWERS AND DRAINS. By Arthur P. Poley. (Eyre & Spottiswoode.)

Correspondence.

ARCHITECTS' BENEVOLENT SOCIETY.

SIR,—May I ask the hospitality of your journal to give further publicity to a matter which has already been referred to in your columns? In response to the appeal which I recently made on behalf of the Architects' Benevolent Society, Mr. Walter Emden offered to contribute 50*l.* if nine other gentlemen would give a like sum. Mr. William Glover, already a generous benefactor of the Society, has promised to support Mr. Emden's offer, and I shall be glad to hear from other gentlemen to the same effect.

In addition to forming one of the nine contributors, Mr. William Glover has promised a second donation if a further 450*l.* is contributed by nine (or *any* number) of donors before Christmas.

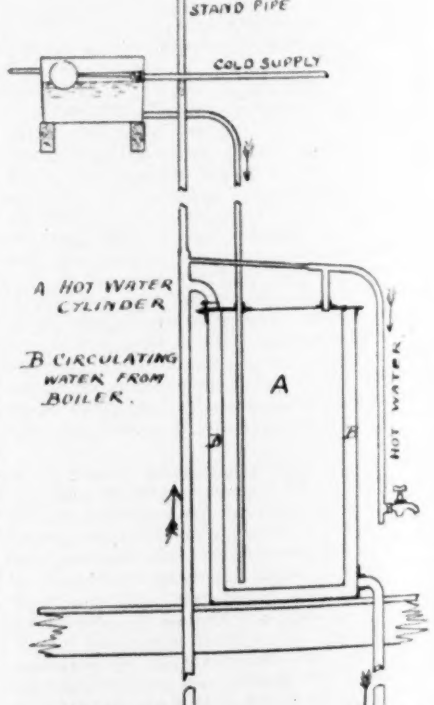
I will not ask you to afford me the space to enumerate the merits of the cause; but, for the sake of a society which performs so beneficent a work among our poorer brethren, or their widows and orphans, throughout the United Kingdom, and which is urgently in need of funds, I trust the above offers will meet the support which they eminently deserve.

JOHN BELCHER,
President.

20, Hanover-square, London, W.
October 25.

SCALE IN BOILERS.

SIR,—The water here is very hard, and consequently we are accustomed to the alarms caused by "thumping" and the expense attending the periodical "scrape," and as the outcome of a neighbourly conference I have been working out some experiments in conjunction with an engineer of wide experience and successful dealing with scale in steam-generating boilers, and with a view to the construction of a workable system for my friend's house. The apparatus has been temporarily "rigged up" in a stable loft for testing, and is now ready for putting into its permanent place in the house to replace the "thumper." If you or any gentleman interested would like to see it I shall be most happy to arrange for him to do so.



The arrangement is a dual system, but instead of a coil I use a double tank—the larger and outer one 44 in. by 18 in., the inner one 42 in. by 16 in.; both are bolted to a common top.

The larger and outer tank, with the annular space of 2 in., is fitted with the usual supply and flow pipes to the boiler, and forms a circulating system, a stand pipe giving room for expansion and vent for any air or steam. The inner tank is fed from the ordinary system and has a service

pipe leading to the taps. The water in the inner tank never goes into the boiler at all, but is heated by the water in the outer tank. A small connexion is made between the service pipe and the stand pipe for the purpose of making up any waste caused by evaporation.

The first point we desired to ascertain was whether the dual system delayed the heating of the service water, and we found it did not do so appreciably. We placed thermometers carefully covered with asbestos in contact with the outer and inner tanks, and found that the transference of heat began at once, and the *difference* gradually lessened until it became 2° F. only, at which point it remained.

We then tried heating up and drawing off the water, and starting from a temperature of 186° and 184°, we drew 68 gallons, the final temperature being 117°; this we reckoned to give enough hot water for seven good baths consecutively, as fast as the water would run, the fire in the meantime being down. The firing arrangement was crude, being outside the building, but even with this we could make a bath every half-hour without reducing the temperature in the cylinder; so we concluded that the transference of heat was so rapid as to make no practical difference between this dual arrangement and the ordinary single cylinder. The amount of heat, of course, depends on the fire burnt, the 2° difference in temperature being practically negligible.

As to the main principle of the system, the water in the outer tank is used over and over again, and having once deposited its solids, is freed from deleterious matter, and so prevents scale getting on the boiler or in the circulating pipes.

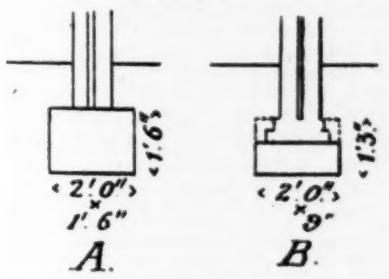
Should salts be deposited in the inner tank they are harmless, and can be removed through the manhole.

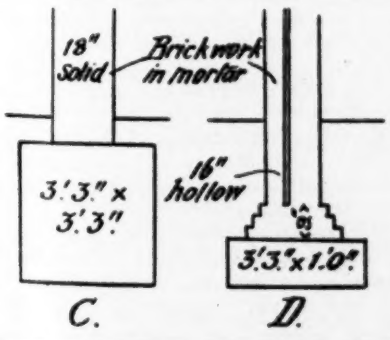
The extra expense is that of the double cylinder, but this is small by the side of the *annual* expense of cleaning the boiler, to say nothing of the risks of worse troubles.

Grantham. E. GOULD.

RURAL BUILDING BY-LAWS.

SIR,—The enclosed cutting from a Southampton paper throws an interesting light upon the present administration of the South Stoneham Rural District by-laws. The bungalow cottage referred to has footings of 1-6 cement concrete 2 ft. wide and 18 in. deep to enable the long low walls to resist the surface pull of a clay soil, and also to avoid brick spreading courses offering temptations





towards the use of bats. These concrete footings were said to be "no proper foundations," and not in accordance with by-law No. 20, in not having more than the one offset, although that by-law specially says: "The diminution of the footings to be in regular offsets, *or in one offset at the top of the footings*."

A second cottage on the same plan was to have had similar footings, but these being again objected to, I provided weaker ones, partly of brick, and they are duly approved. Sketches A and B will explain.

Upon my asking if there would be any objection to filling up the corner spaces (enclosed by dotted lines), the committee said, "None whatever," although, as I pointed out, the approved footing with corners filled up (B) would be of the same shape as the disapproved one (A), but 3 in. shallower and with weaker material at the centre.

In another South Stoneham building I provided wall and footings as at C. These were disapproved, but, being altered, were approved as shown at D.

It is incomprehensible that a council should persist in ignoring their by-law providing for the use of an alternative form of footing most suitable to a district containing both excellent gravel and slippery clay. R. M. LUCAS.

GARDEN CITY—A REPLY TO THE LAMBETH CRITIC.

SIR,—In the report stated by you to be presented by Councillor Bristowe to the Lambeth Borough Council (see page 426 *ante*), the following criticisms are made against the Garden City scheme at Letchworth:—

(1) The first prize cottage had large patches of plastering *already left* the walls.
(2) Not a house on the estate could be applied to London or its suburbs.
(3) The boasted 150*l.* house is a myth.
(4) The gardens are no larger than are usually found in country places.
(5) The company gave 40*l.* an acre for the land, but let on building leases at 17*l.* 10*s.* an acre.
(6) The company will clear 100*l.* out of each conference.

In reply to these criticisms I beg to state:—

(1) No plaster has left the walls of the first prize cottage. Certain visitors have prised the plaster off to see its thickness, and it is quite as good as the average plaster used in London houses. The prize for this cottage was awarded by the eminent judges employed by the Exhibition Committee, including two leading architects, and the criticism is entirely misleading.

(2) The object of the Exhibition was to demonstrate the kind of cottage to be built in *rural* districts. London is not a rural district. There are, however, many houses on the Garden City Estate which are suitable for London. Councillor Bristowe apparently did not see the Garden City proper, and the Cheap Cottages Exhibition which he visited occupied seventeen acres out of 3,818 comprised in the estate.

(3) By the evidence of the judges, which included Sir William Chance, Professor Lethaby, Professor Sims Woodhead, and Miss Octavia Hill, most of the cottages entered for the 150*l.* prize were built for that sum. The builders of the first prize cottage now offer to repeat it for 175*l.*, including profit and fees.

(4) It is satisfactory to learn that cottages in the central area of Garden City have gardens as large as *country* cottages usually have.

(5) The land for the Cheap Cottages Exhibition has been let at from 7*l.* to 15*l.* an acre—the average being about 10*l.*, which represents a loss to the company.

(6) The first Garden City Company had *no connexion whatsoever* with the conference attended by Councillor Bristowe. The conference was called by the National Housing Reform Council, and the Garden City Company only lent the hall in which it was held, without charging any rent. The charge of 5*s.* was made by the Housing Council, and did not, I understand, pay expenses. In view of the interpretation placed on this statement by Councillor Bristowe, I have requested him to immediately withdraw it.

If not the result of prejudice, the report represents such a total ignorance of the facts of the case that I should have refrained from taking any notice of it but for the way in which it has been taken up by the Press.

I hope, in justice to a movement to which in the past you have shown the utmost fairness and given the favour of your sympathy, you will publish this reply in full.

THOS. ADAMS,
Secretary, First Garden City, Ltd.,
347-351, Birkbank Bank-chambers,
October 19, 1905.

GARDEN CITY PRIZE COTTAGE.

SIR,—While giving Mr. Ferry full credit for trying to improve Mr. Houfton's plans, I think I should prefer to live in the house as it was, provided that the larder were approached from the lobby next stair, and the water-closet from an outside door. A small point, that of placing the purlins vertically, is open to question. If Mr. Ferry reversed his bath and shifted his shelf to hang over it when not in use and to fold up at other times a saving of space would be made. A similar folding dresser under the window might prove better than the angular one in the original plan. Sinks are better when directly under a window, and angle fireplaces in either plan would be an improvement to bedrooms now lacking them.

There is far more economy of space in the landing of the prize design. Mr. Ferry's suggestion as to the copper seems to have much practical commonsense to recommend it. An important point in the planning of cottages, conspicuous by its absence, is the provision for the reverent removal of the dead from upper rooms.

E. SWINTEN HARRIS.

*** Mr. Harris's last remark touches on a point which is important, and to which we do not remember ever to have seen attention called before. We heard of a case where, after a death in the upper floor of a cottage, it was necessary to pull down part of the wall to get the dead body out.—ED.

PRIZE COTTAGES.

SIR,—To those visitors to Letchworth who had any practical knowledge of building it was evident that the prices with which most of the cottages were labelled were misleading, in some cases simply absurd and impossible. One result will be disappointment to those amateurs who try to reproduce such places under actual conditions of ordinary building.

It is regrettable that the prize and some other plans likely to be adapted largely have the grievous defect of outside fireplaces. To any, especially a poor country cottager, an inside fireplace, whose warm chimney-stack airs and dries the whole house, is invaluable for comfort, health, and economy.

It has been remarked that ideas for "week-end boxes" are more in evidence than workmen's requirements. T. R. HOOPER.

The Student's Column.

STEAM BOILERS AND PIPES.—XVII.

CHIMNEYS (*continued*).

BEFORE passing away from the consideration of chimneys, it is desirable that some attention should be devoted to the questions of stability and practical construction. If treated fully, these subjects would furnish ample material for several articles, but our intention is merely to give a few notes such as are appropriate to the present series, referring readers to other sources of information for more detailed treatment and fuller particulars.

The Stability of Brick Chimneys.—An isolated chimney shaft is essentially a tower and may fail by crushing at any section under the weight of the superincumbent brickwork, or by overturning at any section when the moment of the horizontal wind force above that section exceeds the moment of the weight on the same section.

As a general rule the proportions which insure safety against one mode of failure are sufficient to guarantee the security of the structure against the other mode. Nevertheless, it is well to consider separately the effects of the vertical and horizontal forces.

In order that the strain, due to the weight of brickwork, upon any horizontal section may be kept within proper limits, the sectional area of the chimney must be increased from the top downwards. The increase of area evidently causes a further increase of pressure of which due account has to be taken.

When a chimney is proportioned in strict accordance with this procedure, its outline possesses a concave batter like that which has been largely adopted in lighthouse construction. In ordinary practice, however, and especially for chimneys of less than 300 ft. high, a straight batter is almost universal, one important advantage of the outline thereby given being that the accuracy of the work can be readily verified by the eye during the course of execution.

The necessity for more or less intricate calculations for determining the sectional area of chimneys is frequently obviated by the regulations of local authorities.

For instance, the rules of the London County Council demand the observance of the following measurements:—

Width at base of square chimneys, one-tenth of total height.

Diameter at base of round chimneys, one-twelfth of total height.

Batter to be 2½ in. in every 10 ft., or 1 in 48.

Thickness of brickwork to be at least 8½ in. from top to 20 ft. below, and increased by 4½ in. for every additional 20 ft. of height, measured downwards.

These measurements are independent of the fire-brick lining.

No cornice or other projection must stand out more than 8½ in. at the top of the shaft.

Molesworth's "Pocket-book" gives the following general rules for the proportions of brick chimneys:—

"The diameter at the base, one-tenth to one-twelfth of the height.

Batter of chimneys, 0·3 in. to the foot.

Thickness of brickwork, one brick from top to 25 ft. from ditto; one and a half bricks from 25 ft. to 50 ft. from the top, increasing by half brick for each 25 ft. from the top.

If the inside diameter at the top exceeds

4 ft. 6 in., the top length should be one and a half bricks thick."

Péclet comments upon the difficulty of making reliable determination of the varying area of a chimney at different heights, and recommends proportions dictated by practical experience.* In his treatise, the interior batter is stated at from 15 to 18 millimetres per metre, and the exterior batter at from 24 to 30 millimetres per metre. The thickness of the brickwork at the top is taken at 10 centimetres, the length of an ordinary brick.

Denoting by d and d^1 the interior and exterior diameters at the chimney top, and by D and D^1 the interior and exterior diameters at the bottom, Péclet gives the following equations :—

$$D = d + 2Hm$$
$$D^1 = (d + 0{\cdot}20) + 2Hm^1$$

where m represents the interior batter, and m^1 the exterior batter. Converting metrical to British measurements, the interior batter becomes 0·216 in. per ft., and the exterior batter 0·36 in. per ft., or about 1 in 55, and 1 in 33 respectively.

To illustrate the use of his rules, Péclet takes as an example a chimney, 20 metres in height, and with a diameter of 60 centimetres at the top.

Then, taking the value of m at 18 millimetres, the interior diameter at the base will be :—

$$D = d + 2Hm$$
$$= 0{\cdot}60 + (2 \times 20 \times 0{\cdot}018) = 1{\cdot}32 \text{ metres.}$$

The exterior diameter at the top will be

$$(0{\cdot}60 + 0{\cdot}20) = 0{\cdot}80 \text{ metre,}$$

and, taking the value of m^1 at 30 millimetres the extreme diameter at the base will be

$$D^1 = \tfrac{1}{2}(d + 0{\cdot}20) + 2Hm^1$$
$$= \tfrac{1}{2}(0{\cdot}60 + 0{\cdot}20) + (2 \times 20 \times 0{\cdot}030)$$
$$= 0{\cdot}80 + 1{\cdot}20 = 2 \text{ metres.}$$

Mr. W. W. Christie† recommends that the lengths of each varying thickness of a chimney should be from 20 ft. to 30 ft., with an outside batter of 1 in 30 to 1 in 36, and that in all cases each section should be calculated for stability, which will also aid in determining the thickness of the brickwork.

The following proportions are given in "Spon's Dictionary of Engineering"‡ as fairly representing the average thickness of brickwork for square chimneys about 200 ft. high, with the top width of from 6 ft. to 6 ft. 6 in. Commencing at the top and working downwards :—

The first	25 ft.	should be	1	brick	thick.
„ next	25 ft.	„	1½	bricks	„
„ „	30 ft.	„	2	„	„
„ „	30 ft.	„	2½	„	„
„ „	35 ft.	„	3	„	„
„ „	35 ft.	„	3½	„	„
The bottom	20 ft.	„	4	„	„

The safety against crushing of any horizontal section of a chimney, proportioned in accordance with the foregoing rules, can be verified by reference to any reliable data as to the strength of brickwork, after calculating the weight of the superincumbent masonry per square foot of sectional area. For information upon this point the reader is referred to the valuable results obtained by a committee of the Royal Institute of British Architects, and recently published in book form.§ The only previous investigation of a similar character was that undertaken by the American Society of Civil Engineers in 1887-88, and a condensed summary of the results then ascertained will be found in the same publication.

In considering the effects of wind pressure upon a chimney, the force may be taken as being exerted in a horizontal direction, and assumed to be of uniform intensity at all heights above ground level. Although not strictly accurate, these assumptions may be adopted in practice without leading to appreciable error.

The greatest intensity of wind pressure, observed in Great Britain, against a flat surface directly opposed to it is stated by Rankine at 55 lb. per square foot. This is still adopted as the maximum pressure for consideration, although in 1868 a considerably higher intensity was registered at Liverpool during an extremely violent hurricane.

In the United States, the general practice of engineers is to assume 50 lb. per square foot as the highest wind pressure to be considered. It is worthy of note, however, that in the tornado of 1896 at East St. Louis, Ill., the force of the wind was estimated at about 90 lb. per square foot. On that occasion the brick chimney of the electric-light station was partially destroyed and blown down.

In the case of a cylindrical chimney the total pressure of the wind against the side is about one-half the total pressure against a diametrical plane of the chimney. Hence, even a hurricane representing a force of 90 lb. per square foot against a flat surface exerts a pressure only 45 lb. per square foot upon a cylindrical chimney.

Let p denote the intensity of wind pressure against a flat surface; and A the area of a diametrical vertical section of a chimney above any given horizontal section or bed-joint.

Then the total wind pressure (P) against the chimney will be

$P = pA$ for a square chimney.
$P = pA \times 0{\cdot}5$ for a round chimney.
$P = pA \times 0{\cdot}75$ for a hexagonal chimney.
$P = pA \times 0{\cdot}7$ for an octagonal chimney.

The resultant in each case may be assumed to act in a horizontal direction through the centre of gravity of the vertical diametrical section of the chimney above any given horizontal joint.

Let H denote the height of the centre of gravity of such a section. Then for the moment of the wind pressure we have

$HP = HpA$ for a square chimney.
$HP = HpA \times 0{\cdot}5$ for a round chimney.
$HP = HpA \times 0{\cdot}75$ for a hexagonal chimney.
$HP = HpA \times 0{\cdot}7$ for an octagonal chimney.

It is obvious that, to insure the safety of the structure, the value of the moment of wind pressure must not be greater than the least moment of stability of the portion of the chimney above the horizontal joint under consideration.

When the axis of a chimney is truly vertical, the moment of stability has an equal value in every direction. In practice, however, it is rarely the case that the axis is exactly vertical, and the least moment of stability is that which opposes a lateral pressure acting in the direction towards which the chimney inclines.

Rankine gives the following method of determining the least moment of stability.

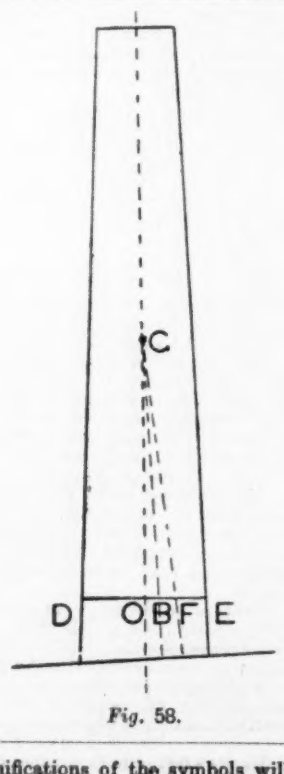


Fig. 58.

The significations of the symbols will become clear by reference to Fig. 58.

Let G be the centre of gravity of the part of a chimney which is above the joint D E, and B a point in the joint D E vertically below the centre of gravity; and let the line D E = d represent the diameter of that joint which traverses the point B. Let q^1 represent the ratio which the deviation of B from O the middle of the diameter D E bears to the length d of that diameter. Let F be the limiting position of the centre of resistance of the joint D E nearest the edge of that joint towards which the axis of the chimney leans, and let q denote the ratio which the deviation of F from O the middle of the diameter D E bears to the length d of that diameter. Let W denote the weight of the chimney above the joint D E.

Then the least moment of stability is denoted by

$$\text{W. B F} = (q - q^1)\ \text{W}d \quad \ldots \quad (40)$$

The value of the co-efficient q is determined by considering the manner in which chimneys are observed to give way to the pressure of the wind. As a general rule, failure commences by the opening of a bed-joint, such as D E (Fig. 58) at the windward side of the chimney. A crack thus begins which usually extends itself in a zig-zag form diagonally downwards along both sides of the chimney, tending to separate it into two parts, an upper leeward part and a lower windward part divided from each other by an oblique fissure.

The final destruction of the chimney occurs, either by the horizontal shifting of the upper portion until it loses its support from below, or by the crushing of a part of the brickwork at the leeward side.

In order that the stability of a chimney may be assured, there must be sufficient vertical pressure at every point of each bed-joint to overcome any tendency of the joint to open at the windward edge. Experience shows that this condition may be sufficiently fulfilled by limiting the deviation of the centre of resistance from the centre, or, in other words, by limiting the value of q, so that the intensity of pressure at the leeward edge of the bed-joints shall be not more than double the mean intensity of pressure.

As the thickness of the brickwork in a chimney is small in comparison with the diameter of the structure, the following values of q are generally accepted in practice :—

For square chimneys $q = 0{\cdot}33$
For round chimneys $q = 0{\cdot}25$

Substituting these values in the expression for the least moment of stability, the following equations express the condition of stability for square and round chimneys :—

For square chimneys

$$HpA = (0{\cdot}33 - q^1)\ \text{W}d \quad \ldots \quad (41)$$

For round chimneys

$$HpA \times 0{\cdot}5 = (0{\cdot}25 - q^1) \quad \ldots \quad (42)$$

From these equations the subjoined formulæ are deduced. Let t = the mean thickness of the brickwork above any given horizontal joint; w = the weight of brickwork per cubic foot. Then we have for the weight (W) of the chimney above any given joint :—

For square chimneys

$$\text{W} = 4wtA \quad \ldots \quad (43)$$

For round chimneys

$$\text{W} = 3{\cdot}14wtA \quad \ldots \quad (44)$$

Substituting these values in equations (41) and (42) we have

For square chimneys

$$Hp = (1{\cdot}33 - 4q^1)\ wtd \quad \ldots \quad (45)$$

For round chimneys

$$Hp = (1{\cdot}57 - 6{\cdot}28q^1)\ wtd \quad \ldots \quad (46)$$

These formulæ can be applied to find the greatest intensity of wind pressure that a chimney will withstand with safety when its dimensions and form and the thickness of the brickwork are known; and, with suitable adaptation, to find the requisite mean thickness of the brickwork above each horizontal joint, when the greatest intensity of wind pressure, and the dimensions and form of the chimney are known.

It may be pointed out, however, that as the shell of a chimney usually consists of a series of steps, or divisions, the thickness being uniform in each division, but varying from one division to another, it is only necessary to apply calculations to the horizontal joints between these divisions, where the stability is evidently less than at the intermediate joints. The same applies also to the bed-joint at the base of the chimney.

* "Traité de la Chaleur." Liége. p. 88.
† "Chimney Design and Theory." New York. p. 75.
‡ "Supplement to Spon's Dictionary of Engineering." p. 352.
§ "Report of Brickwork Tests." 1905.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

Bishopsgate-street.—The Improvements and Finance Committee were authorised to approach the London County Council on the subject of the improvement of Bishopsgate-street between Angel-alley and the City boundary, with instructions to endeavour to arrange a conference thereupon.

Ocean Wharf.—Mr. Harvey Preen moved that the question of a suggested erection of an ocean wharf for the Port of London be referred for examination to the Special Port of London Committee. He said that the scheme was to erect near Dartford an ocean wharf with a frontage of a mile and a quarter, and to send the goods landed there by rail to London.—Mr. Cooper pointed out that under the provisions of the Thames Conservancy Act a channel would be created in the river 30 ft. deep and 1,000 ft. wide.—The motion was eventually carried.

Blackfriars Bridge.—The Bridge House Estates Committee presented a report on a letter of the London County Council relative to the decision to reintroduce its Tramways Bill of last year, and inviting the Corporation also to introduce a Bill for the purpose of either widening or rebuilding Blackfriars Bridge. The Committee recommended that a Bill be promoted empowering the Corporation to widen Blackfriars or construct a new bridge out of the revenues of the Bridge House Estates, the terms of any accommodation granted to the County Council being subject to arrangement.—Mr. Deputy Algar, in moving the adoption of the report, stated that a conference had taken place between a deputation from the London County Council and the Committee, and Sir Benjamin Baker, who had been consulted, said that there were no engineering difficulties in widening Blackfriars Bridge 20 or 30 ft., but he did not favour the construction of a new bridge for trams only.—Mr. Moojen, as an amendment, proposed the omission of all reference to the widening of Blackfriars Bridge. He suggested that the City should build a new bridge near the Temple, which would be available for linking up the tramway system in the subway under Kingsway and Aldwych, and that, on the other side of the river, Stamford-street should be widened. After some discussion the amendment was lost, and the Committee's report adopted.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this council was held on Thursday last week at the City Hall, Charing Cross-road, W.C.

Paving Works.—The Works Committee reported having received a communication from the Sanitary Block and Tile Pavement Co. stating that they were prepared to relay an area of from 1,500 yds. to 2,000 yds. super. of King's-road, Eaton-square, with 3-in. blocks on a mortar bed ½ in. in thickness, the blocks to be made by the Hastings Pavement Co., of New York, by a new process. The company suggested that the blocks should be tried for six months, when, if satisfactory, they would relay the remainder of the street in a similar manner. The company are under agreement with the Council to maintain the pavement for fifteen years from September, 1901. It was agreed to accept the offer, the trial to be for twelve months. The Committee reported having called upon the Improved Wood Pavement Co. to relay certain portions of various streets in the City.

Private Works Affecting Public Way.—On the recommendation of the same committee it was agreed "that it be a standing order that when the Council consent to the execution of private works affecting the public way their consent shall be conditional on the works being completed within a stated period, to be fixed in each case subject to any variation which may be made by the Council on application in special circumstances." Hitherto the Council has placed no limit on the time during which such works as vaults, pavements, lights, etc., shall be completed.

Utilisation of Destructor Clinker.—The Committee further reported having instructed the Assistant City Engineer to make inquiries and to report on the setting up of brick and flag making plant for utilising the clinker from the destructor at Shot Tower Wharf.

Appointment of Quantity Surveyor.—On the recommendation of the Housing Committee, Mr. F. H. A. Hardcastle was appointed quantity surveyor in connexion with the proposed workmen's dwellings in Marshall-street.

Street Widenings.—The Improvements Committee submitted a long report dealing with the proposed widening of Great College-street, Little College-street, and Wood-street, and it was agreed, on the recommendation of the Committee, to surrender certain plots of land to the Ecclesiastical Commissioners in exchange for other plots.

CHURCH INSTITUTE, PENARTH.—A new Congregational church institute has been erected at Penarth. The builder was Mr. J. Jones, of Penarth, the architect being Mr. W. Beddoe Rees, of Cardiff.

OBITUARY.

MR. WALLER.—Mr. John Green Waller, F.S.A., died at the age of ninety-two on October 19, at No. 75, Charlton-road, Blackheath. Mr. Waller was an honorary member of the Royal Archæological Institute and a past-President of the Quekett Society. He was a fellow pupil of G. F. Watts, J. C. Horsley, and Mr. W. P. Frith, R.A. (retired), at Sass's art school. He then entered the Royal Academy Schools, where he won the silver medal for drawing the academy figure, and the life studentship in 1836. Mr. Waller designed the painted window with medallions of Chaucer and Gower, and scenes from Chaucer's life and poems, which in 1868 was inserted above Chaucer's tomb in Westminster Abbey. Having devoted himself during a considerable period to topographical and archæological studies, he pursued some important investigations into the story of the streams of London, and engraved a series of plates illustrative of monumental brasses in England. In his later years Mr. Waller turned his attention to the theory and practise of microscopical science, and became an eminent member of the Quekett Society. He contributed several papers to the *Transactions* of the London and Middlesex Archæological Society.

MR. STENNING.—The death is announced of Mr. Oswald Francis Stenning, in his thirty-fourth year. On leaving Haileybury School, Mr. Stenning entered the office of his father, Mr. Alexander Stenning, of Cannon-street, architect, and in 1903 was elected out of a large number of candidates as surveyor to the Merchant Taylors' Company.

GENERAL BUILDING NEWS.

ROMAN CATHOLIC CHURCH, ANNITSFORD.—The Right Rev. Dr. Collins, Bishop of Selinius, recently laid the chief stone of the new Roman Catholic Church, to be dedicated to St. John the Baptist, for the Annitaford Mission. The building will accommodate 450 worshippers, and the cost will be about 6,000*l*. It is being built by Mr. John Charles Ferguson, of Newcastle, from plans by Mr. James Charles Parsons, architect, also of Newcastle.

CHURCH, DUNDYVAN, N.B.—A new parish church is to be built at Dundyvan, Coatbridge, upon an elevated site in Henderson-street. It is in the form of a Latin cross, with nave, aisles, transepts, and chancel, and provides accommodation for 800 worshippers. The west front has two entrances, both leading to a large vestibule and giving access to the gallery, while at the east side there are two exit doors, one of which forms the entrance to the session-house and vestry. The building is of red stone from Closeburn Quarries, Dumfries. The main entrance is marked by a tower, surmounted by a Scots crown and provided with a bell. The total cost is 10,000*l*. The architect is Mr. Alexander Cullen, Hamilton.

ASTON WORKHOUSE CHURCH.—On the 19th inst. the Chairman of the Board of Guardians, Aston, laid the memorial-stone of the new workhouse church, which is about to be erected on the east side of the workhouse, facing Union-road. The building has been designed to accommodate about 450 persons, and the cost will be about 2,500*l*. The architects are Messrs. C. Whitwell & Son, of Birmingham, and the builders are Messrs. W. Lee & Son, of Aston. It is to be built of red brick, and it will have a slated roof.

HOLY TRINITY CHURCH, EXMOUTH.—The foundation-stone of the work of restoring and enlarging Holy Trinity Church, Exmouth, was laid on the 18th inst. by the Bishop of Crediton. The scheme embraces, in addition to the internal work, the encasing of the tower and the whole of the nave in Ipplepen limestone, with Bath stone dressings; the building of a north transept, vestries, organ loft, and the lengthening of the chancel. The cost of this work will be 6,092*l*. 17s. 4d. The architect is Mr. George H. Fellowes Prynne.

PRIMITIVE METHODIST CHURCH AND SCHOOL, WATERHOUSE, STAFFORD.—The foundation-stones were laid a short time ago at Waterhouse of a new Primitive Methodist church and schools. The buildings comprise a porch, giving access to both chapel and school—chapel to seat about 170 and school to accommodate about 125 children—minister's vestry and vault. Internally, the chapel will be finished with figured pitchpine, open ornamental pitchpine principals, and the windows glazed with coloured lead lights. The building is designed after the Elizabethan style, and the porch is carried up as a turret. The dressings to the openings and buttresses will be of Alton stone. The builders are Messrs. J. Fielding & Son, of Alton, and the architects, Messrs. Ford & Slater, of Burslem.

CHURCH EXTENSION, DERBY.—St. Augustine's Church, at New Normanton, is to be enlarged by the addition of a south aisle. The architects are Messrs. Naylor & Sale, of Derby.

CHURCH RESTORATION, WINGERWORTH.—The parish church of Wingerworth, which has been restored, was recently reopened by the Bishop of Southwell. The work of restoration includes a new east window, constructed by Messrs. Clayton & Bell, London. The pillars and tower have been stripped and plastered, and the floors have been relaid. The gallery has been removed, the heating apparatus re-arranged, and a new coil placed in the chancel. The whole of the work has been carried out under the supervision of Mr. P. H. Currey, Diocesan architect, Derby.

CHURCH RENOVATION, GREAT WAKERING.—St. Nicholas Church, Great Wakering, which has been closed for renovations, was recently re-opened. The work has been carried out by Mr. E. Burgess, of Great Wakering, under the direction of Mr. A. Blomfield Jackson.

CHURCH RESTORATION, LANDRAKE.—The tower of the parish church of Landrake has been restored. The work was carried out under the direction of Mr. E. Sedding, architect, of Plymouth. The south and west parapets, including two angle pinnacles which were out of the perpendicular, have also been restored, and the walls have been strengthened by grouting with liquid cement.

WESLEYAN CHAPEL, BRACKLEY.—A new Wesleyan chapel has been opened at Brackley. It is Tudor Gothic in style, and has been constructed of old stone redressed, its facings being of hard Bath stone. The seats are of red deal, and the pulpit is of pitchpine. The building is warmed by low-pressure hot-water apparatus and illuminated by incandescent gas. With the accommodation afforded by the small gallery over the narthex, the new church seats 450 people. The site cost about 1,000*l*., and the contract of Mr. G. F. Booth, of Banbury, who has carried out the work, was for 2,000*l*. Messrs. Ewen Harper & Brothers, of Birmingham, were the architects.

WESLEYAN METHODIST CHAPEL, RAVENSTONE.—The foundation-stones of a new Wesleyan Methodist chapel were laid at Ravenstone on the 11th inst. The building, which is being erected by Messrs. Hewes Brothers to designs prepared by Messrs. Goddard & Wain, architects, of Coalville, consists of red brick, with Derbyshire stone dressings at the front. The main room is 57 ft. long by 25 ft. wide, and is calculated to accommodate about 250 people. There are also outbuildings for social gatherings.

SCHOOL, ABERDEEN.—The new school in Frederick-street has been occupied by classes since the holidays in August, but the work has only just been practically finished. The general plan of the new school may be described as a combination of the "corridor" and "central hall" plans. The total length of the building is 154 ft. 6 in. and the width 69 ft. There are two entrances, for boys and girls respectively. There are five classrooms for infants on the ground floor, containing accommodation for 332 scholars. Towards the front of the ground floor is situated the central hall and gymnasium, which measures 59 ft. by 32 ft. On the first floor there are seven classrooms, with cloakrooms for boys and girls respectively, and teachers' rooms. On the second floor there are six classrooms, and also a cookery-room, which, with its scullery, will be fully equipped, and there is also a manual instruction room and a wood store. In all, the school has accommodation for 1,116 pupils—332 infants and 784 boys and girls—seniors and juniors. A special feature of the school is the playground on the roof. Instead of the ordinary wood-framed and slated roof the whole area of the building is laid with concrete upon steel beams and joists, the concrete being ultimately covered with Limmer asphalt 1 in. thick. The whole of the roof playground is enclosed by parapet walls, 9 ft. high at the lowest parts. At the west end of the building there has been erected a steel fire escape staircase, with access to it from the roof and each of the upper floors. Regarding the exterior walls of the school, the basement floor is built in rustic ashlar, and the walls above in hammered, blocked, and sneck ashlar. The building is lighted by electricity. The Department has sanctioned a loan of 18,000*l*. to cover the total cost, including heating, ventilating, desks, and furnishings, and all other expenses, exclusive of the cost of site. The school was planned and designed by the School Board's architect and master of works, Mr. J. A. O. Allan. The contractors were:—Mason work, Messrs. Gall & Walker; carpenter work, Messrs. Hendry & Keith; slater work, Mr. Forbes Morrison; plaster work, Messrs. J. Scott & Son; plumber work, Mr. Alex. Fiddes; painter and glazier work, Messrs. George Donald & Sons; electric lighting, Mr. John F. Anderson; heating and engineering work, Mr. Robert Tindall; steam boiler, Messrs. J. Abernethy & Co.; desks, Messrs. James Garvie & Sons; furnishings, Messrs. J. and A. Ogilvie.

CATHOLIC SCHOOL, SPRINGFIELD.—At Springfield, Gidlow, recently, the Roman Catholic Bishop of Liverpool laid the foundation-stone of the new day school erected in connexion with the Mission Church of the Sacred Heart. The new school consists of a central corridor 8 ft. wide, with a window over each end. On the north side will be the mixed school, 65 ft. by 22 ft., divided into three classrooms by movable screens. On the south side of the corridor, facing Kimberley-street, will be the infants' school, 38 ft. by 19 ft.,

consisting of two classrooms, divided from each other by a movable screen. At each side of the infants' school are the cloakroom, the teachers' room, and the cleaner's room. The corridors and cloakrooms have salt glazed brick dadoes, 4 ft. high, and the dadoes in the classrooms are pitch-pine. The external walls are faced with Ravenhead bricks, with Withnell red plastic brick dressings. The roofs will be covered with Vellenhelli slates, and the flats over cloakrooms with vulcanite. The ventilation will be entrusted to Messrs. Robert Boyle & Son, and all the classrooms will be heated by wall fires. Mr. Matthew Honan, of Liverpool, is the architect, Mr. Joseph Ellison, of St. Helens, the contractor, and Mr. John Webster, of Manchester, the clerk of works.

COUNCIL SCHOOL, CAMBRIDGE.—A new school, erected by the Cambridge Town Council, has been opened in Romsey-avenue, Mill-road. The cost has amounted to over 9,000*l*. The architects were Messrs. Goodey & Creshall, Mr. Elliott being the clerk of the works and Messrs. Clark the builders.

BOARD SCHOOL ENLARGEMENT, KEMNAY, N.B.—Additions, consisting of four classrooms and two additional classrooms for the higher department, are being made to the Kemnay Board School. There will also be provided two lavatories and cloakrooms and teachers' rooms, and the whole will be grouped round a central hall 59 ft. long by 25 ft. wide, which will be lighted and ventilated by three large cupolas. Messrs. Kelly & Nicol, of Aberdeen, are the architects for the work.

PARISH INSTITUTE, ST. DAVID'S.—The new Parish Institute for St. David's (Exeter) was opened a short time since. It is of red brick with Bath stone dressings, the interior woodwork being green stained, except the ribbed barrel ceiling; this is left plain in main hall, which will accommodate about 300. In addition to the hall, the Institute comprises a large billiard-room, two reading-rooms, a Morris tube range on the ground floor. On the upper floors are a games-room, library, writing-room, classrooms, etc. The architect is Mr. Harbottle Reed, of Exeter, and the builders Messrs. Ham & Passmore.

MINIATURE RIFLE RANGE.—Lord Roberts, on Tuesday, the 17th inst., opened a miniature rifle range constructed for Dr. Jaeger's Company on the roof of their premises in Milton-street and Moor-lane, E.C. The range was designed by and carried out under the superintendence of Mr. Godfrey C. Lambert, architect.

COTTAGE HOMES, TREDEGAR.—The cottage homes which have been erected by the Bedwellty Board of Guardians at Tredegar were opened on the 18th inst. The homes are built on a site in Tredegar Park, facing the recreation grounds, and adjoining Park-row. Accommodation is provided for seventy-five children, fifteen in each home, the master and matron being provided with accommodation in the centre block. The buildings are faced with red pressed bricks, and have slate roofs. The architect is Mr. W. Beddoe Rees, and the contractor Mr. J. Newcombe, builder, Tredegar. The cost of the homes amounts to between 8,000*l*. and 9,000*l*.

LIBRARY, BRYNMAWR.—The Brynmawr Carnegie Public Library was opened on the 18th inst. by Mr. Ll. Thomas, J.P. The newly-completed library building is of local stone, with fronts of rock-faced Pennant stone, the window dressings, etc., being of Ebbw Vale Co.'s buff bricks. The entrance doorway is executed in Forest of Dean stone. On the left hand of the entrance hall is the borrowing library, out of which opens the librarian's room. On the right hand is a large reading room, and at the rear are the necessary outbuildings. The first floor is reached by a staircase, where a reference library, storeroom for books and papers, and a magazine-room are provided. The work has been carried out by Mr. John Jenkins, builder and contractor, Brynmawr, the entire work being from designs by and under the supervision of Mr. F. R. Bates, architect and surveyor, Newport.

SURREY COUNTY ASYLUM, MERSTHAM.—On Wednesday last week the foundation-stone of the new county asylum for Surrey at Merstham was laid. The asylum is being built with a view to accommodating some 900 patients in the first instance, and subsequently 1,200. The site is on the hill between Coulsdon and Merstham stations. Mr. G. T. Hine is the architect, and Messrs. J. Bowen & Sons, of Birmingham, are contractors for the superstructure.

CONSERVATIVE CLUB, NORTH SHIELDS.—The new branch Conservative Club in Prudhoe-street, North Shields, was opened on the 17th inst. The architect was Mr. William Hope, of Cullercoats and Newcastle, and the contractor Mr. Joseph Newbolt, of North Shields.

MASONIC HALL, GRAVESEND.—Ruckland House, which stands in the neighbourhood of Wrotham-road, Gravesend, has been converted into a masonic hall. The alterations have been carried out by Messrs. W. H. Archer & Son, from plans drawn by Mr. G. W. Cobham, architect.

PARISH HALL, FOREST GATE.—The foundation-stone of the new parish hall erected at the back of St. Mark's Church, in Lorne-road, Forest Gate, was laid a short time ago. The building is being erected at a cost of 1,800*l*., by Messrs. Mattock & Parsons, from the plans of Mr. Henry A. Saul, architect, of Gray's Inn-square, W.C.

MEDICAL MISSION HOSPITAL, PLAISTOW.—The new medical mission hospital in Balaam-street, Plaistow, recently opened by Princess Louise, has been built at a cost of about 6,000*l*. Accommodation is provided for twenty-two beds for women and children. The architect for the work was Mr. H. G. Lander.

PAROCHIAL HALL, HOWDON.—The foundation-stones of the new parochial hall for St. Paul's Church, Howdon Panns, were laid on the 21st inst. The buildings, which have been designed by Mr. G. G. Carr, of Gateshead, will cost between 1,500*l*. and 1,600*l*., exclusive of the furnishing. On the ground floor there will be a gymnasium and two classrooms, while upstairs will be a large hall, capable of accommodating about 400 people. Mr. W. Cook, of Rosehill, is the contractor.

BILLIARD-ROOM, ILFORD.—A new billiard-room has been opened at the premises of the Ilford Conservative Club. The work was carried out from the designs of Mr. R. Thomson, architect, by Messrs. Hammond & Miles, architects.

COTTAGES, HULL.—Cottages are to be erected shortly on an estate of about 12 acres situated at the corner of Marfleet-lane, on the Holderness-road, Hull. The frontage of land for each house will be about 27 ft. The houses are to be brick built and slated. Messrs. Wellsted & Easton, Hull, are the architects.

FREE LIBRARY, MONTROSE.—The new public library at Montrose was opened by Mr. John Morley, M.P., on the 19th inst. The building has been constructed of stone from Closeburn Quarry and the roof of green Westmorland slates. The height of the building from the street to the top of the flèche is 67 ft. The principal entrance is at the junction of High-street, Bridge-street, and Mill-road, and is an arched opening between pilasters, surmounted by a pediment, in which is carved the burgh arms executed by Messrs. Earp, Hobbs, & Millar, London and Manchester. The contractors were:—Messrs. Ford & Son, builders, Montrose; Messrs. W. Black & Son, joiners, Brechin; Messrs. John Lindsay & Son, slaters, Montrose; Messrs. Scott & Son, plasterers, Aberdeen; Mr. J. L. Warden, plumber and electrical engineer, Montrose; Mr. John Oswald, blacksmith, Brechin; Mr. W. Milne, glazier, Montrose; Messrs. Burgess & Son, plasterers, Montrose (for tile work); Messrs. Hope & Son, Birmingham (steel casements); Messrs. Peacock, heating engineers, Dundee; and Mr. D. Reid, painter, Montrose (librarian's house). Mr. Arthur Bolton, Brechin, was the clerk of works, and the architect was Mr. J. Lindsay Grant, whose designs were accepted in competition. The cost, excluding site, is estimated at about 7,500*l*.

NEW BATHS, OLD KENT-ROAD.—New baths, erected for the Camberwell Borough Council from the designs of Mr. E. Harding Payne, have just been opened in the Old Kent-road. As we shall give an illustration and plans of these in a week or two, we reserve a detailed description to accompany the publication of the plans.

STAINED GLASS AND DECORATION.

WINDOW, ST. STEPHEN, SHEPHERD'S BUSH.—A stained-glass window has just been erected in the Lady Chapel of the Church of the Holy Ghost of St. Stephen, Ashchurch-grove, Shepherd's Bush. It consists of two lights with tracery. In the central portions are figures of S. Charles Borromeo vested as Archbishop of Milan, and S. Catherine of Siena in her dominican habit. In smaller panels below are represented incidents in the lives of these saints, viz., the vision of S. Catherine and S. Borromeo as Cardinal administering the holy sacrament to the dying at the Plague of Milan, 1550. The tracery contains "The Descent of the Holy Spirit." The window was designed and painted by Mr. E. Stanley Watkins, of Ealing.

FOREIGN.

FRANCE.—At the Académie des Beaux-Arts M. François is the candidate "en première ligne" for the seat vacant by the death of Henner; MM. Besnard and Robert-Fleury are candidates in the second line; M. Raphaël Collin in the third line; M. Lhermitte in the fourth. To these names the Académie has added those of MM. Gabriel Ferrier, Maignan, Toudouze, Friant, and Gervex. ——M. Paul Colin, Inspecteur-Général de l'Enseignement du Dessin, has been appointed member of the Conseil Supérieur des Beaux-Arts, in place of the late M. Guillaume.——The Under Secretary of State for Art is at present considering the changes which are to be made in the Louvre as soon as the Colonial Department have vacated the galleries now occupied by them. The Pavillon de Flore, which that Department now occupies, will be entirely transformed and annexed to the Museum. The upper stories, occupied at present by various offices and workrooms connected with the museum, will be entirely cleared out. The works of art which have been stored in the attics for want of room, will at length be brought forth to light and exhibited to the public. At the same time a new classification of the French schools is to be made. Another advantage will be that the remarkable collection of architectural drawings in the possession of the Louvre will be exhibited.——At Lilas, in the environs of Paris, a new Salle des Fêtes has been opened, also a new group of schools and a public garden. All are from the designs of one architect, M. Leopold Bévière.——The Fourth exhibition of the Société des Beaux-Arts of Cannes will be opened on December 26, to remain open till February 10.——The jury in the competition opened for a new hospital for Perpignan have selected M. Baille, of Perpignan, as the architect to carry out the work; awarding premiums to M. Resplandy (Tunis) and MM. Carlier & *fils* (Montpellier).——The death is announced, at the age of 73, of M. Ludovic E. Durand, the sculptor, a pupil of Toussaint and of M. Bonnat. He had received several medals in the Salon, though he hardly exercised his art in any works except those of portrait sculpture. Among the numerous busts which made his reputation may be mentioned those of Dr. Legrand and of Admiral Besnard, and the monument to the celebrated asylum physician Dr. Pinel, erected in the Boulevard de l'Hôpital, opposite the Salpêtrière.——We have to record also the death of M. Marquette, architect, and a Chief Inspector of Museums and of Instruction in Drawing. He was the author of a design for a Salle des Fêtes for the town of Denain, which had just been approved by the Conseil-Général des Bâtiments Civils.

SOUTH AFRICA.—Building is proceeding apace in Winburg; the orphanage is nearing completion, and will be a creditable structure when finished.——The annual meeting of the Natal Building Society has been held in Durban and was well attended. The accounts submitted showed that in spite of the depression, the total assets had reached 429,546*l*., being the largest attained since the establishment of the society.——In Cape Town, Messrs. Maxwell & Earp are erecting a six-storied building on a site acquired by them some years ago, the contract price of which is said to be 26,000*l*. The builder is Mr. George Bradford. It is anticipated locally that contracts will shortly be entered into for the erection of new schools in conformity with the Education Act.——The Town Engineer of Klerksdorp reports to the local Town Council that he has prepared a plan of the proposed market buildings, the estimated cost of which is 3,000*l*.

MISCELLANEOUS.

GLASGOW TECHNICAL COLLEGE.—The opening of the present session of the Architectural Craftsmen's Society was inaugurated on the 20th inst. by Mr. T. L. Watson, F.R.I.B.A., who delivered a lecture on "Italian Art" to a large audience under the presidency of Mr. Colin Sinclair. Mr. Watson showed how the influence of Grecian art asserted itself on the work of the Italian masters, coming through Rome on the one hand and Constantinople on the other. He followed the development of Italian art through its various stages, explaining in detail the work of the more notable artists of Florence, Venice, Rome, Ravenna, etc., in architecture, sculpture, painting, and metal work. The lecture was illustrated by a series of lantern views.

CASSELL'S BUILDING CONSTRUCTION.—This work, by Professor Henry Adams, the first Part of which was noticed in our last issue, is, we find on reference to an advertisement which we had overlooked, to be completed in 20 parts. It is always better, however, to state that on the cover of a publication issued in parts.

THE LONDON COUNTY COUNCIL AND THE BUILDING ACT.—The Works Committee of Camberwell Borough Council, in a report issued on Saturday, state that their engineer has informed them that the London County Council is proposing to erect a new Council school in Victoria-road, and that no notice has been sent by the London County Council as to the erection of the buildings. For private purposes it would be necessary for the owner to set back to a line 20 ft. from the centre of the road, but the wall of the proposed school premises will be situate at distances varying from 13 ft. to 17 ft. from the centre of the roadway only. The Committee had resolved to ask the London County Council why the conditions of the Building Act have not been required to be complied with in this case.

AN OLD ENGLISH FRESCO.—A discovery was made at Rye on Monday last week. Messrs. C. Fletcher & Son, decorators, were carrying out some alterations at a house in Market-street, which has just become tenanted, when behind a fine block of solid oak panelling a well-preserved specimen of old English fresco was discovered. The house is part of the old Flushing Inn, which is believed to have been many years ago the headquarters of smugglers. The work, which is clearly decipherable, though painted upon the plaster, which it seems has never been affected by dampness, is illustrative of flowers and leaves, the former including the Tudor rose, weird figures of humanity, animals and birds, a very dear quotation from the Magnificat, and the words, "Soli deo honore," thrice repeated. There are two other inscriptions in old English lettering, but these cannot be clearly seen. The English and

French coat-of-arms, the horns and the fleur-de-lys are depicted more than once, and it is believed that the work is of the XIVth century period.—*Kentish Express.*

NORTHAMPTON BUILDERS' ASSOCIATION.—The Northampton Builders' Association held its annual dinner at the Peacock Hotel recently, when the President, Mr. G. W. Souster, occupied the chair. The vice-chair was occupied by the Vice-President (Mr. J. T. Powell). The loyal toast having been honoured, Mr. H. W. Hanwell gave "The Mayor, Magistrates, and Members of the Corporation." The Mayor first replied, and in the course of his remarks he said that when he came to office he confessed he hoped for a revival of trade. Unfortunately, that revival had not come so quickly as he had anticipated; still, he thought that so far as the staple trade was concerned they had taken a turn for better things—and that improvement would, he hoped, extend to all other trades. Messrs. Martin and Green and Councillor Wright also replied.—Mr. A. P. Hawtin, giving "The Architects," expressed the hope that the day would speedily come when they would be fully employed. He hoped it not alone for their sakes, but for the sake of those willing men who walked the streets of the town unemployed.—The toast having been honoured, Mr. Ingram, who first responded, believed that although trade was not in the state they desired, the future could be faced with hope.—Mr. Stevenson said that if architects were permitted to survive the next year they would find trade in a brisker state. At present he was afraid the building trade was in rather a bad way, and he did not see any prospect of an improvement. In a town which relied upon one trade for its prosperity, the state of that trade was of vital importance.—Mr. Dorman thought that better times were in store, and Mr. Fidler and Mr. Gibbins also replied.—Mr. Caleb Archer, of Wellingborough, gave "Success to the Northampton Builders' Association," and remarking upon his fifty years' connexion with architectural work, alluded to the great advance which building had made in its methods during that period.—The Chairman briefly responded to the toast, which was heartily received.—Mr. Redwood, of London, submitting "The Town and Trade of Northampton," observed that some time ago much was talked about the evils of American competition in the boot trade; little was heard of it now. The ability and energy of the Northampton manufacturers and tradesmen could, he thought, be trusted to hold its own always against competition of that sort without any outside help.—The toast having been drunk, Mr. S. B. Wilkinson replied. He believed that trade was slowly reviving. Trade would have to be attracted, and that could not be done by increased rates. To do it they rather needed cheap land and low rates. He congratulated the Northampton builders on the fact that if they could not find work at home they sought it elsewhere. The works in course of erection by Northampton contractors in various parts of the country were a testimony to their energy, enterprise, and reputation.—Councillor Henry Green proposed "The Visitors," and replies were made by Mr. F. Oates, of London, and Mr. George Wilkinson.—Mr. W. Heap gave "The President," and Mr. Souster responded. The other toasts were "The Vice-President," given by Mr. George Harris and replied to by Mr. J. T. Powell; "The Secretary," submitted by Mr. Martin and responded to by Mr. F. J. Airs; and "The Host."

ENGINEERING LECTURES AT UNIVERSITY COLLEGE.—The Council of University College, London, have decided to divide the annual three terms' work in the engineering department since the resignation of Professor Vernon Harcourt, and have invited Mr. H. Deans, of the Great Western Railway staff, to lecture upon "Railways" during the first term; Mr. A. T. Walmisley, Engineer to the Dover Harbour Board, to lecture upon "Waterways and Harbours" during the second term; and Mr. W. W. Blair, Engineer to St. Pancras Local Board, to lecture upon "Roads, Street Paving, and Tramways" during the third term.

MEMORIAL TABLETS, NEWPORT.—The unveiling of two memorial tablets to the memory of the late Alderman T. Jones, of Newport, took place recently. The tablets, which are from the studio of Mr. Giscombe John, R.A., consist of facsimiles in bas-relief, and have been placed in the town hall, Newport, and the corporation hospital at Allt-yr-yn.

VICTORIA MEMORIAL, YORK.—The statue which has been erected at York to the memory of the late Queen Victoria has just been unveiled by Her Royal Highness the Princess Henry of Battenberg. It is situated in the Guildhall, and is of white Carrara marble on a dark red base. The work is that of a local sculptor, Mr. George W. Milburn.

THE BARRIER IN ST. PAUL'S CHURCHYARD.—A "fire inquest" has been held in the City Coroner's Court respecting the fire which occurred on September 27 at No. 63, St. Paul's-churchyard. Dr. Waldo stated in opening the inquiry that the building was 200 years old and all the walls were wood-lined. Colonel Fox, of the Salvage Corps, and Superintendent Evans, of the London Fire Brigade, testified to the dangerous construction of the premises and to the obstruction presented to the passage of the engines and appliances of the brigade by the barrier across the road in front of the chapter house. As a rider to their verdict upon the origin of the fire the jury recommended that the Dean and Chapter should be asked to give such prompt facilities for the removal of the barrier in case of a fire as might be necessary. On the occasion in question some delay arose in opening the barrier; the padlock scutcheon had become stiff through long disuse, and was eventually broken open by a fireman; no lives fortunately were lost, but the loss of time might have been attended with fatal consequences, for the fire spread with great rapidity, and fourteen persons were in imminent peril. The cathedral authorities are averse to the permanent abolition of the barrier, but will concur in any suggestion which does not involve its removal.

THE LIGHTING OF ALDWYCH AND KINGSWAY.—Some special plant for producing increased pressure has been fitted in a vault near the new street in connexion with the gas supply. Tenders were made for the supply of light and the maintenance of lamps at a minimum of 700 candle-power per lamp. The tenders amounted to 27*l.* and 15*l.* on the part of the electrical light and gas companies respectively. The latter illuminant has been adopted, and will be used in about fifty lamps, having apiece an average power, under increased pressure, of 1,000 candles, which is equivalent to about 50 per cent. in excess of the average light of an arc lamp.

BLACKFRIARS BRIDGE.—The Court of Common Council have adopted, by a large majority, a report framed by the Bridge House Estates Committee of the Corporation, which recommends the introduction of a Bill, in course of the ensuing session, which shall enable the Corporation to either widen Blackfriars Bridge to an extent of from 20 to 30 ft. or construct a new bridge at the cost of the Bridge House Estates revenues. The report was made in connexion with the expressed intention of the London County Council to reintroduce in Parliament their measure for laying down tramway lines along Westminster and Blackfriars Bridges, and the Council's request to the Corporation to widen or rebuild Blackfriars Bridge. The bridge was built in 1865-9 by J. and H. Cubitt and H. Carr.

A NEW WHARF ON THE THAMES.—A special committee of the Court of Common Council has been instructed to consider, and report upon, a proposal for the construction of a riverside wharf opposite Dartford, to be 3,600 ft. in length, with provision for an amount of traffic estimated at 3,000,000 tons. The promoters do not seek for any financial assistance from the Corporation.

MEMORIAL TO DEAN HOWELL.—A memorial to the late Dean David Howell has been erected by members of his family in St. David's Cathedral. The memorial consists of a mural tablet, executed by Mr. Goscombe John, A.R.A., containing a bronze panel with a medallion portrait of the late Dean set within a frame of Numidian marble.

BELGIAN ART EXHIBITION, GUILDHALL.—The exhibition in the Guildhall Art Galleries for next year will include examples of the Flemish School in the XVth-XVIth centuries, many of which, it is hoped, will be lent from abroad, specimens of the XVIIth century painters, comprising Rubens and Vandyck, and works of the modern Belgian artists. Mr. Temple, director of the Guildhall Gallery, has received many assurances of support from Brussels and elsewhere, and anticipates that a highly interesting collection of pictures will thus be brought together.

ROYAL SANITARY INSTITUTE.—At an examination in Hygiene in its bearing on School Life, held in Leicester on October 20 and 21, two candidates entered for the whole examination, and two for Part I. only. The following candidates were awarded certificates:—Evangeline Halsey (Birmingham); Alice Emily Moss (Birmingham). Miss Belle Hall (Leicester) passed Part I. only of the examination.

Legal.

ACTION BY A QUANTITY SURVEYOR.

THE case of Howard *v.* Mappin, on the 25th inst., came before Mr. Justice Bucknill and a jury in the King's Bench Division, an action by the plaintiff, a quantity surveyor, of the Outer Temple, to recover from the defendant, Mr. Walter Samuel Mappin, 529*l.* for work done in connexion with a building scheme of defendant at Twickenham.

Mr. Garland appeared for the plaintiff, the defendant not being represented and absent.

In opening the case for the plaintiff, Mr. Garland said the sum in question was composed of 290*l.* for quantities at the rate of 2 per cent. on the lowest tender, viz., 14,493*l.*, the balance being made up of work done in revising the quantities, for the reduction of the estimate. Defendant did not appear, but had put in a defence to the effect that he denied the indebtedness and that he ever gave the plaintiff any instructions.

Mr. Alfred Howard, the plaintiff, said that in February, 1903, he was consulted by Messrs. Billing, Son, & Rowley, architects, Tooley-street, to prepare estimates for quantities for the erection of certain flats at Twickenham for the defendant, and he did so. He was afterwards advised to revise the quantities, and this he also did, resulting in the present claim. It transpired that the building scheme had never been carried out and defendant had not taken any notice of witness's applications for payment.

In the result the jury returned a verdict for the plaintiff for the amount claimed, and judgment was entered accordingly with costs.

BUILDER'S APPEAL CASE UNDER THE WORKMEN'S COMPENSATION ACT.

THE case of Howells *v.* Thomas came before the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Romer and Mathew, on the 25th inst., on the appeal of the defendant against an award made by the judge of the Pontypridd County Court, sitting as arbitrator under the Workmen's Compensation Act, 1897.

Mr. S. T. Evans, K.C., and Mr. Kelly appeared for the appellants, and Mr. Bailhache and Mr. Jacobs for the respondent on the appeal.

Mr. Evans, in opening the case, said that the applicant in the court below was Thomas Howells, and he filed his request for arbitration in respect of injuries he sustained while working in a quarry on the Blaen-Cly-Dach building estate. The defendants were a firm of builders. The County Court Judge gave his decision on January 18 of this year, awarding the injured man 1*l.* a week. On March 11, however, Howells died from the effect of his injuries, and his widow, taking out letters of administration, had filed a request for a different scale of compensation—a lump sum—in respect of the death of her husband. That matter the County Court Judge had adjourned, pending the hearing of this appeal, the point being whether or not the County Court Judge was right in holding that the case came within the Act at all. The first question was whether the defendant was the undertaker of the quarry. Defendant said he was not. The second was whether Howells was a workman within the meaning of the Act. The defendant contended that he was a contractor, or a person doing work on his own account, and selling produce to defendant. The facts were as follows:—The defendant was building two cottages on the estate in question for two persons who had permission from the proprietors of the estate to take stone from the quarry (forming part of the estate), to be used in building the cottages. Howells arranged with the defendants to get the stone from the quarry at 1*s.* 6*d.* per load. It was while Howells was so engaged in the quarry that he met with the accident. Counsel contended that in the circumstances the County Court Judge was wrong in holding that the defendant was the "occupier," and therefore the "undertaker," of the quarry, and further that he was wrong in deciding that the man was a workman within the meaning of the Act. The evidence clearly established, he submitted, that the man was an independent contractor.

Without calling upon counsel for the respondent, the Master of the Rolls, in giving judgment, said he was unable to say on the evidence that the County Court Judge was wrong in holding that Howells was in the employ of the defendant. The question was one of fact, and there being evidence to support the view of the County Court Judge, this Court could not interfere. As the defendant's servant, therefore, Howells' occupation of the quarry involved their occupation, and rendered the defendant "undertaker" within the meaning of the Act. The appeal failed on both points.

The Lords Justices concurred, and the appeal was accordingly dismissed with costs.

ARE PORTERS SERVANTS?

IT will be remembered that the case in which the Kensington Borough Council summoned Mr. W. H. Collbran, at the Kensington Petty Sessions, for unlawfully allowing rooms in mansions—1-26, Sussex-mansions, Sussex-place—to be used as dwelling-rooms, was adjourned in order to hear the decision of the Borough Council on a proposition made to them by Mr. Collbran.

Mr. Chambers Leete, in stating the case for the Borough Council on Tuesday, last week, gave some additional information. He said that the rooms were occupied solely by the porters, and not in conjunction with other rooms, and they were very stuffy and unfit for use as dwelling and sleeping-rooms.

The sub-committee reported to the Public Health Committee that the use of these rooms should be discontinued, because they did not comply with the Act. They were nearly a foot below the level of the street and were not ventilated, as they had closed areas. One room had no fireplace, and the windows did not, as they should, open externally into the open air. Therefore in no instance did they comply with the Act.

Mr. Collbran, when first summoned in January, 1905, had written a letter expressing his willingness to do any work the Council thought necessary. The Council replied that they were prepared to consider any proposal, but not prepared

to make any suggestion. After sending this reply, the Public Health Committee were then advised that the structural difficulties were too great to allow of any satisfactory alterations being made, and that these defects were too serious to allow of the rooms being used as sleeping apartments any longer.

Chairman: How long have they been occupied?

Mr. Leete: They have existed and been occupied nine years before the Public Health Committee took action last January. In July last it was reported that nothing had been done to make the underground rooms amenable to the Act, except that in Block 3 iron gratings had been put in the area instead of glass prisms. Mr. Collbran was then informed that the occupancy must at once be discontinued or proceedings would be taken.

Mr. Collbran replied by asking for an interview, and Mr. Chambers Leete responded that, as it seemed impossible to make the alterations necessary so that the buildings would conform with the Act, an interview seemed needless.

Mr. Collbran: The plans were submitted and passed before I began to build.

Mr. Leete handed some plans up to the Bench, and pointed out that there was nothing in those plans to indicate that the rooms were going to be used as living rooms.

Mr. Leete, resuming his statement, said that Mr. Collbran in his last letter asked the Borough Council to allow his caretakers to continue occupation until 1906, when he would be able to obtain land in the rear on which he could build, and thus bring the rooms into conformity with the Act. The Public Health Committee, however, would not take the responsibility of allowing this state of things to continue.

Referring to sub-clause 6 of the Act, Mr. Leete observed that the rooms might be said not to be separately occupied, because the occupants rendered service to the people above; but his reply to this was that the porters did not occupy a room above in conjunction with the rooms below, and so came under the sub-clause. The two underground rooms were the rooms occupied in conjunction.

Chairman: The mischief is done, and you permitted it. The magistrates have been to view the premises, and the moment you come to the top of the stairs leading from the porters' rooms you land on the first floor. This must have been indicated on the plans. What do you want defendant to do? One doesn't give the first floor to the caretakers.

The Inspector gave evidence as to finding that the rooms did not comply with the Act.

Chairman: Why did you go just then—after saying nothing for nine years?

Mr. Leete: The first plans were submitted in 1896. There was nothing on them to indicate that the rooms would be used as living rooms.

Mr. Collbran: Those plans handed up by Mr. Leete are merely drain plans. Here are the plans I submitted, and the rooms are plainly marked as "porters' rooms."

Mr. Leete pointed out that if plans had been submitted they would have been retained. How, then, came Mr. Collbran to be possessed of them? The Borough Engineer, to whom such plans were submitted, was ill, and if his evidence was required he (Mr. Leete) would have to ask for another adjournment.

Dr. Dudfield, Medical Officer of Health, was called. He was satisfied that the rooms did not comply with the Act.

By Chairman: There had been no infectious or fatal illness since the rooms had been occupied. The rooms were stuffy and ill-ventilated.

By Mr. Collbran: The additional ventilation put in did not remove the structural deficiencies. The ventilation was still bad.

Mr. Collbran, in his defence, said that he interviewed Mr. Weaver, the Borough Engineer, and the plans were passed. He (Mr. Collbran) was as anxious then as he was now to comply with the Act. In his own interests he submitted the plans, for plans were easy to alter and buildings were not. With regard to the meaning of the words "in conjunction," if the rooms above did not exist, neither would the rooms below. This forms "the conjunction."

Chairman: You build this place with the determination to use every square inch.

Mr. Collbran: Yes. With the ground rent I have to pay I am bound to.

Chairman: Why do you not appeal to the Local Government Board, because they have power to mitigate the difficulties of the situation?

A member of the Bench here pointed out that the porters and tenants were not to be in conjunction. According to the meaning of the Act, the rooms were to be "in conjunction."

Mr. Collbran raised another point in his own defence. The porters were servants; they made beds, went errands, watered plants, etc.

Mr. Leete: They are servants of Mr. Collbran. This is substantiated by the fact that these porters are given the service franchise. As servants of the tenants they would not be entitled to it.

The Bench retired to consider, and on resuming their seats the Chairman said: The feeling of the Bench is that they must put the construction on the Act that the words imply, "conjunction with occupation in another part of the house," and do away with the idea of service. There are circumstances which point to mitigation, and we know the Borough Council do not desire a vindictive fine. There are three summonses, with a penalty of 1*l.* a day, and this equals a fine of 3*l.*

Mr. Collbran said that the porters were sleeping in the flats above, and had been ever since the point was raised.

The Chairman said he was glad to hear it, but as they were not sleeping upstairs when the summonses were issued he must, on the point of law, impose the fine of 3*l.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

20,498 of 1904.—J. SHAW: *A Smoke Preventer and Fuel Economiser for Domestic Fire Grates.*

This invention relates to a baffle composed of fire-clay, or fire-clay and asbestos, to be placed at the entrance of the flue in a domestic fireplace, occupying the position of the register plate in a register grate. The baffle is made about the size of the opening, and constructed at such an angle as to cause the flame to impinge on it, leaving ample space for the draught. The asbestos and fire-clay become incandescent from the action of the flame, increasing heat and preventing smoke.

21,887 of 1904.—W. E. CATESBY, J. T. CATESBY, and A. G. CATESBY: *Linoleum, Carpets, and Other Similar Floor Coverings.*

This relates to means for matching the corners of borders for floor coverings, consisting of a corner square of similar material bearing a design adapted to turn the pattern of said border round said corners, so that said pattern continues throughout said border and matches at the corners.

21,938 of 1904.—T. JACKSON: *Furnace Brick for Use at the Tops and Fronts of Furnaces.*

This relates to a furnace brick, consisting of a refractory body part, with or without a moulded-in central tube, and a longitudinal bonding bolt or pin carrying extended end-plates or washers, which are clamped against the opposite ends of the said body, so as to prevent the disintegration or separation of the pieces of the brick in the event of the same splitting or fracturing under the influence of heat.

24,386 of 1904.—R. STANLEY: *Combined Apparatus for Grinding or Crushing, Washing, and Separating Ores.*

This relates to an apparatus for treatment of ores, comprising rolls between which the material is reduced to a coarsely ground condition, finishing rolls adapted to allow only a thin layer of material to pass between them, a travelling belt of gauze underneath the finishing rolls to catch the material falling therefrom, means of any kind for forcing the crushed material through the gauze into a trough below same, means for re-distributing the material that cannot pass through the gauze to the finishing rolls for re-grinding.

24,546 of 1904.—T. W. RICKSON: *Fireproof Walls and Partitions.*

This invention relates to a fireproof wall or partition constructed of sections or slabs, having chambers or cells, horizontal dovetail recesses along each face, a longitudinal recess along the top and bottom edges thereof, and vertical end slots.

24,562 of 1904.—P. M. JUSTICE (E. C. KOOP): *Binders or Securing Means for Scaffolding and the like.*

This invention relates to a binder for scaffolding and the like, comprising a plate adapted to engage the pole or the like, and a chain or chains adapted to be passed around a pole or the like, and to be secured to the plate at two points, the means for securing at least one of the points being capable of receiving and holding any part of the chain.

24,804 of 1904.—J. W. WITTER: *Apparatus for Cooling the Air in Rooms and the like.*

This relates to an air-cooling apparatus for rooms, comprising a plurality of air passages, each provided with one substantially straight side or wall and one wall corrugated or fluted with long, gradual, easy curves, means for driving the air through said passages, and means for refrigerating the walls of said passages.

26,566 of 1904.—G. J. WHITFIELD. *Mechanism for Operating Window Sashes.*

This relates to a mechanism for operating window sashes, consisting essentially of the employment of spring-controlled pulleys, around which the connecting cords are coiled with ratchet and pawl-controlling mechanism actuated by a rocking shaft and cords.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

1,005 of 1905.—G. P. MESSENGER: *Bearings for Revolving Cowls for Chimneys, Ventilators, and the like.*

This invention consists in the construction of bodies of oil boxes for revolving cowls or ventilators, by casting them in one piece with guides for the revolving spindle, and fitting said bodies with steel or other metal plugs for the spindle to work upon.

2,448 of 1905.—A. WAKEFIELD: *Earthenware Sanitary Pipes and such like Articles.*

This invention relates to sanitary pipes and such like articles, consisting in shaping the shoulder of the socket so that a portion thereof extends further outwards than the remaining part, the result being to provide two ledges within the socket, and also shaping the spigot end so that a gap is left in its circumference equal to the said extended portion of the shoulder of the socket, or thereabouts, the end of the spigot of a pipe thus formed being adapted to engage with the interior of the socket of another such pipe in such a way as to ensure a true invert and otherwise satisfactory joint when the said pipes are laid in position.

2,478 of 1905.—G. H. TRUXELL and G. M. BURGET: *Concrete-Wall-Forming Machines.*

This relates to concrete-forming machines, comprising an overhead trackway with or without a turntable constructed thereon, a moulding box suspended from said trackway, and adapted to travel thereon, and means for adjusting said moulding box.

3,575 of 1905.—W. JOHNSON: *Window Sashes.*

This invention relates to a sash which, being hung on cords with balance weights in the usual way, can be easily removed for cleaning or other purposes. The sash is made in two parts, an outer part or frame being hung on cords with the ordinary sash or balance weights, and an inner frame which carries the glass. To make the sashes or frames weathertight small grooves are made on the one and beads on the other, when the frames are together, and used as one and disengage when the screws are released.

4,346 of 1905.—J. EDWARDS: *Lock Bolt.*

This relates to a lock bolt, operated by a key, the bitts fitting into teeth in the top of the bottom bolt and the bottom of the top bolt, lifting the levers and releasing the teeth from the pin in the bolt, pulling the bolts back simultaneously on the turning of the key.

7,701 of 1905.—O. S. SMITH: *Lavatories and Slabs for same.*

This consists of a slab for lavatories, made of highly-glazed fireclay, white or other colour, and made with back and ends in one piece, and having a separate basin held up by brackets against an opening in the slab.

10,702 of 1905.—J. SOSS: *Hinges.*

This relates to a hinge composed of two similar yoke-shaped frames or supports, having corresponding openings in their corresponding sides, and segmental swinging plates or members pivoted within said openings adjacent to the corresponding sides thereof, the said segmental swinging plates or members being crossed, and the segmental swinging member pivoted in one frame or support, being extended into and adapted to turn and swing freely within the other, and means for guiding the movement of said members in said frames or supports, and for limiting the same.

11,381 of 1905.—W. PEEL: *Construction of Gates and Hinges therefor.*

This relates to a gate, consisting of an arrangement of a pivoted vertical rail or rails, to act by side thrust against nuts or the like on a tie-bar formed with a hinge part, and thereby communicating tensional strains to the gudgeon.

11,736 of 1905.—R. KAYE and E. EMMOTT: *Latches and Striking Plates for Holding Swing Doors in the Closed Position.*

This invention relates to latches and striking plates for holding swing doors in the closed position, and has for its object to provide a latch and striking plate in such a manner that swing doors are instantaneously held in the closed position, however hard the door may be swung to from either direction.

12,960 of 1905.—A. HEBERT: *Seat Guards for Water-Closets and the like.*

This relates to an hygienic pad or block for water-closets and like seats, consisting of an arrangement wherein the sheets are each provided with a tongue to permit of easily removing the same, said tongues being impregnated with insulating material.

27,061 of 1904.—D. D. MCBEAN: *Construction of Subaqeous Tunnels.*

This relates to a method of constructing subaqeous tunnelling, consisting in arranging sections of the tunnel roof in their proper positions, excavating the material beneath each section, and completing the tunnel structure in the excavated spaces.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

October 3.—By SKARDON, SONS, & HOSKING (at Plymouth).

Plymouth, Devon.—1 to 7, Elliot-ter., and 21, Elliot-st., f. (in one lot) £15,000
5, Queen's Gate-villas, and 1, Queen's Gate-mews, f. 1,400
1, Queen's Gate-ter., f. 810
25, Westwell-st. (Temple-chambers), f., y.r. 100*l.* 1,000
Buckland Monachorum, Devon.—"Higher Hellingtown Farm," 20 a. 1 r. 30 p., f. 1,800

October 12.—By J. W. FLORANCE (at Birmingham).

Wrexham, Denbigh.—The Island Green Brewery, with twenty-two tied houses and other property adjoining, f. and l. (in one lot) 73,600

October 17.—By ANSCOMBE & RINGLAND.

St. John's Wood.—37, New-st., u.t. 22 yrs., g.r. 5*l.*, y.r. 38*l.* 280

By C. W. DAVIES & SON.

Clerkenwell.—406, St. John-st., u.t. 16 yrs. g.r. 10*l.*, e.r. 70*l.* 330
Islington.—7, 9, and 11, Frome-st., u.t. 41 yrs., g.r. 20*l.*, w.r. 110*l.* 10*s.* 550

By RD. ROWBOTHAM & CO.

Caledonian-road.—120 and 122, Brewery-rd., u.t. 54 yrs., g.r. 12*l.*, w.r. 153*l.* 8*s.* 980

By FREDK. WARMAN.

Finsbury Park.—25, Digby-rd., u.t. 70 yrs., g.r. 7*l.*, y.r. 42*l.* 400
Tottenham.—West Green-rd., "Ascot Lodge," u.t. 27 yrs., g.r. 11*l.*, p. 490
Fulham.—5, 7, 9, and 11, Munster-rd., u.t. 76 yrs., g.r. 34*l.*, y.r. 144*l.* 1,000
34, Crondace-rd., u.t. 74 yrs., g.r. 7*l.*, e.r. 42*l.* 405
Herne Hill.—1, Woodquest-av., u.t. 70 yrs., g.r. 8*l.*, e.r. 55*l.* 540
Leytonstone.—24, Poppleton-rd., u.t. 88 yrs., g.r. 5*l.* 8*s.* 3*d.*, e.r. 40*l.* 210

By FAREBROTHER, ELLIS, & CO. (at Pontefract).

Ferry Fryston, Yorks.—The Wheldale Wood Lias Lime Works, also "Wheldale Lodge," 166 a. 1 r. 32 p., f. 2,350
Part of Fryston-pk., with the "Keeper's House," 162 a. 2 r. 12 p., f. 2,050
Two plots of land, 3 a. 2 r. 13 p., f. 100
Three enclosures, 13 a. 2 r. 10 p., f. 520
Freehold corn mill and 5 a. 2 r. 17 p., y.r. 30*l.* 535

October 18.—By E. HORNE.

Richmond Hill.—54, Rosemont-rd., f., e.r. 45*l.* 610

By ERNEST OWERS.

Hampstead.—30, Platts-la., f., e.r. 75*l.* 1,065

By ORGILL, MARKS, & BARLEY.

Southwark.—24, Tooley-st. (The "Mitre Tavern"), and 14, Duke-st., f., y.r. 140*l.* .. 4,000
15, Duke-st. (s.), f., y.r. 60*l.* 1,220

By PRICE, ARROW, & TAYLOR.

Clapham.—6, Wilkinson-st., u.t. 58 yrs., g.r. 6*l.*, e.r. 40*l.* 380

By C. P. WHITELEY.

Camberwell.—Southampton-st., f.g.r. 20*l.*, reversion in 73 yrs. 505
174 to 184 (even), Southampton-st., f., w.r. 146*l.* 8*s.* 1,545
188, Southampton-st. (smithy), f., y.r. 60*l.* .. 1,150
190 to 198 (even), Southampton-st., f., y.r. 172*l.* 2*s.* 2,585
212 to 218 (even), and 216A, Southampton-st. (s.), f., y.r. 136*l.* 2,170
Southampton-st., f.g.r. 18*l.*, reversion in 26 yrs. 600
1, 6, and 8, Havil-st. (s.), f., y.r. 84*l.* 1,245
Havil-st., f.g.r. 20*l.*, reversion in 33 yrs. 730
124, 126, and 128, Harris-st., f., w.r. 67*l.* 12*s.* 745
Harris-st., f.g. rents 47*l.*, reversion in 32 and 35 yrs. 1,585
Teather-st., f.g.r. 8*l.*, reversion in 75 yrs. 205
200A, 200 to 210 (even), Southampton-st. (s.), f., w.r. 221*l.* 2,150
82 to 108 (even), Harris-st., f., w.r. 288*l.* 12*s.* 2,100
Greenwich.—Fry's-ct., f.g.r. 11*l.*, reversion in 47 yrs. 290

By EDWIN EVANS & T. F. DEASON (at Willesden).

Willesden.—Yewfield-rd., 10 freehold building plots 985

October 19.—By H. J. BLISS & SONS.

Mile End.—59, Alderney-rd. (s.), f., w.r. 28*l.* 12*s.* 390
Forest Gate.—74, Buxton-rd., f., w.r. 31*l.* 4*s.* .. 280
27, Capel-rd., f., w.r. 28*l.* 12*s.* 290
Bethnal Green.—19, Selby-street, f., w.r. 35*l.* 2*s.* 435
Old Ford.—59, 61, and 63, Usher-rd., f., w.r. 104*l.* 1,060

By T. F. DEASON.

Harlesden.—1, Connaught-rd., u.t. 71½ yrs., g.r. 8*l.*, e.r. 50*l.* 280

By EDWIN EVANS.

Barnes.—Cleveland-rd., f.g. rents 43*l.*, reversion in 62 yrs. 1,135
High-st., f.g. rents 43*l.*, reversion in 54 yrs... 1,445

By NEWBON, EDWARDS, & SHEPHARD.

Hoxton.—44, Buckland-st., with workshops, u.t. 30 yrs., g.r. 5*l.*, 5*s.*, y.r. 50*l.* 350
Kingsland.—41, Ware-st., u.t. 27 yrs., g.r. 6*l.*, w.r. 49*l.* 8*s.* 150
Stoke Newington.—150, Albion-rd. (s.), f., y.r. 50*l.* 705
16, Milton-rd., u.t. 46 yrs., g.r. 5*l.*, y.r. 30*l.* 250

By SAUNDERS & SON.

St. Pancras.—45, Stibbington-st. (s.), u.t. 26 yrs., g.r. 20*l.*, y.r. 65*l.* 330

By J. A. & W. THARP.

Bagnigge.—92, Stepney-green, c., w.r. 27*l.* 6*s.* .. 220

By FLICK & SON (at Saxmundham).

Kelsale, Suffolk.—The Church Farm Estate, 176 a. 2 r. 34 p., f. (in lots) 3,600

October 20.—By HORNBLOWER & FLOWER.

Sutton, Surrey.—28, Orchard-rd., u.t. 95 yrs., g.r. 5*l.*, w.r. 20*l.* 18*s.* 220

By NORRIS & HADLEY.

Hammersmith.—1, Faroe-rd., f., y.r. 40*l.* 380

By T. B. WESTACOTT.

Camden Town.—6, Clarence-rd., u.t. 25½ yrs., g.r. nil, w.r. 52*l.* £250
29, Jeffrey-st., u.t. 4½ yrs., g.r. 5*l.* 5*s.*, w.r. 63*l.* 1*s.* 110

Contractions used in these lists.—**F.g.r.** for freehold ground-rent; **l.g.r.** for leasehold ground-rent; **i.g.r.** for improved ground-rent; **g.r.** for ground-rent; **r.** for rent; **f.** for freehold; **c.** for copyhold; **l.** for leasehold; **p.** for possession; **e.r.** for estimated rental; **w.r.** for weekly rental; **q.r.** for quarterly rental; **y.r.** for yearly rental; **u.t.** for unexpired term; **p.a.** for per annum; **yrs.** for years; **la.** for lane; **st.** for street; **rd.** for road; **sq.** for square; **pl.** for place; **ter.** for terrace; **cres.** for crescent; **av.** for avenue; **gdns.** for gardens; **yd.** for yard; **g.r.** for grove; **b.h.** for beerhouse; **p.h.** for public-house; **o.** for offices; **s.** for shops; **ct.** for court.

MEETINGS.

FRIDAY, OCTOBER 27.

Junior Institution of Engineers (*Westminster Palace Hotel*).—Annual General Meeting and first meeting of the Incorporated Institution. 8 p.m.

Royal Sanitary Institute.—Mr. A. Saxon Snell on "Sanitary Building Construction (Advanced)." 7 p.m.

The Auctioneers' Institute of the United Kingdom (*Incorporated*).—The opening meeting of the session, to be held at 5, Whitehall-court, London, S.W., at 7.45 p.m., when the inaugural address will be delivered by the President, Mr. James Boyton.

SATURDAY, OCTOBER 28.

Incorporated British Institute of Certified Carpenters.—Visit to the new Hearts of Oak offices, Euston-road, N.W. 2.45 p.m.

MONDAY, OCTOBER 30.

Royal Sanitary Institute.—Mr. W. C. Tyndale on "Sanitary Appliances." 7 p.m.

London Institution.—Sir R. S. Ball, LL.D., F.R.S. on "A Cruise with the Commissioners of Irish Lights," illustrated. 5 p.m.

WEDNESDAY, NOVEMBER 1.

Royal Sanitary Institute.—Mr. J. Wright Clarke on "Details of Plumbers' Work." 7 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Royal Archæological Institute.—Mr. Alfred Dobrée on "Japanese Sword Blades." 4 p.m.

THURSDAY, NOVEMBER 2.

London Institution.—Mr. M. H. Spielmann, F.S.A., on "Art and Humour," illustrated. 6 p.m.

Architectural Association.—Conversazione, to be held at No. 18, Tufton-street.

FRIDAY, NOVEMBER 3.

Royal Sanitary Institute.—Mr. A. Saxon Snell on "Ventilation, Warming, and Lighting." 7 p.m.

Junior Institution of Engineers.—Presidential address by Mr. Dugald Clerk, entitled "The Problem of the Gas Turbine." 8 p.m.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied **DIRECT** from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.	
Hard Stocks	1	8	0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1	4	0	,, ,, ,,
Facing Stocks	2	0	0	,, ,, ,,
Shippers	2	0	0	,, ,, ,,
Flettons	1	7	0	,, at railway depôt.
Red Wire Cuts	1	11	0	,, ,, ,,
Best Fareham Red	3	12	0	,, ,, ,,
Best Red Pressed Ruabon Facing	5	0	0	,, ,, ,,
Best Blue Pressed Staffordshire	4	1	0	,, ,, ,,
Do. Bullnose	4	6	6	,, ,, ,,
Best Stourbridge Fire Bricks	3	15	6	,, ,, ,,
GLAZED BRICKS.				
Best White and Ivory Glazed Stretchers	12	0	0	,, ,, ,,
Headers	11	0	0	,, ,, ,,
Quoins, Bullnose, and Flats	16	0	0	,, ,, ,,
Double Stretchers	19	0	0	,, ,, ,,
Double Headers	16	0	0	,, ,, ,,
One Side and two Ends	19	0	0	,, ,, ,,
Two Sides and one End	20	0	0	,, ,, ,,
Splays, Chamferred, Squints	20	0	0	,, ,, ,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,, ,, ,,
Quoins, Bullnose, and Flats	14	0	0	,, ,, ,,
Double Stretchers	15	0	0	,, ,, ,,
Double Headers	14	0	0	,, ,, ,,
One Side and two Ends	15	0	0	,, ,, ,,
Two Sides and one End	15	0	0	,, ,, ,,
Splays, Chamferred, Squints	14	0	0	,, ,, ,,
Second Quality White and Dipped Salt Glazed	2	0	0	,, less than best.

BRICKS, &c. (*continued*).

	s.	d.	
Thames and Pit Sand	6	9	per yard, delivered.
Thames Ballast	5	3	,, ,,
Best Portland Cement	26	0	per ton, ,,
Best Ground Blue Lias Lime	19	0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks	27s. 0d. per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	,, ,,
PORTLAND STONE (20 ft. average)—			
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1	,,
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½	,,

	s.	d.	
Ancaster in blocks	1	10	per ft. cube, deld. rly. depôt.
Beer ,,	1	6	,, ,,
Greenshill ,,	1	10	,, ,,
Darley Dale in blocks	2	4	,, ,,
Red Corsehill ,,	2	2	,, ,,
Closeburn Red Freestone	2	0	,, ,,
Red Mansfield ,,	2	4	,, ,,
YORK STONE—*Robin Hood Quality.*			
Scappled random blocks.	2	10	,, ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super., ,,
6 in. rubbed two sides ditto, ditto	2	6	,, ,,
3 in. sawn two sides slabs (random sizes)	0	11½	,, ,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	,, ,,
1½ in. to 2 in. ditto, ditto	0	6	,, ,,
HARD YORK—			
Scappled random blocks.	3	0	per ft. cube, ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	8	per ft. super., ,,
6 in. rubbed two sides ditto	3	0	,, ,,
3 in. sawn two sides slabs (random sizes)	1	2	,, ,,
2 in. self-faced random flags	0	5	,, ,,

	s.	d.	
Hopton Wood (Hard Bed) in blocks	2	0	per ft. cube, deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. sawn both sides random slabs	1	0	,, ,,
,, ,, ,, 2 in. do.	0	8½	,, ,,

SLATES.

In.	In.	£	s.	d.	
20×10	best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20×12	,, ,,	13	17	6	,, ,,
20×10	first quality ,,	13	0	0	,, ,,
20×12	,, ,,	13	15	0	,, ,,
16×8	,, ,,	7	5	0	,, ,,
20×10	best blue Portmadoc	12	12	6	,, ,,
16×8	,, ,,	6	12	6	,, ,,
20×10	best Eureka unfading green	15	17	6	,, ,,
20×12	,, ,,	18	7	6	,, ,,
18×10	,, ,,	13	5	0	,, ,,
16×8	,, ,,	10	5	0	,, ,,
20×10	permanent green	11	12	6	,, ,,
18×10	,, ,,	9	12	6	,, ,,
16×8	,, ,,	6	12	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. ,,
Best Broseley tiles	50	0	per 1000 ,,
Do. Ornamental tiles	52	6	,, ,,
Hip and Valley tiles	4	0	per doz. ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 ,,
Do. Ornamental do.	60	0	,, ,,
Hip tiles	4	0	per doz. ,,
Valley tiles	3	0	,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 ,,
Do. Ornamental do.	54	6	,, ,,
Hip tiles	4	1	per doz. ,,
Valley tiles	3	8	,, ,,
Best "Rosemary" brand plain tiles	48	0	per 1000 ,,
Best Ornamental tiles	50	0	,, ,,
Hip tiles	4	0	per doz. ,,
Valley tiles	3	8	,, ,,
Best "Hartshill" brand plain tiles, sand-faced	50	0	per 1000 ,,
Do. pressed	47	6	,, ,,
Do. Ornamental do.	50	0	,, ,,
Hip tiles	4	0	per doz. ,,
Valley tiles	3	6	,, ,,

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13	10	0	... 15	0	0
Deals: best 3 by 9	13	0	0	... 14	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	0	0	... 12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best.		
Battens: seconds	0	10	0	,, ,,		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	... 10	0	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	... 9	10	0
Foreign Sawn Boards—						
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	,,		

PRICES CURRENT.—*Continued on page 459.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*CENTRAL PUB. LIBRARY BUILD., MARE-ST.	Hackney Borough Council	50, 30, and 20 guineas	Jan. 15
*NEW SECONDARY SCHL. & TECHNICAL INST.	Bedfordshire C.C.	(See advertisement in this issue)	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Shield's-road Sewer, Motherwell	Caledonian Railway Co.	Engineer to the Company, Buchanan-street Station, Glasgow	Oct. 30
Depot, Milton-road	Stowmarket U.D.C.	H. G. Bishop, Architect, Bury-street, Stowmarket	do.
50,000 5-in. Karriwood Paving-blocks	Manchester Paving Committee	Chief Clerk, Highways Department, Town Hall, Manchester	do.
50,000 6-in. Creosoted English Beechwood Pav.-blocks	do.	do.	do.
Road-making, Grantham-road	Newcastle-on-Tyne Corporation	City Engineer's Office, Town Hall, Newcastle-on-Tyne	do.
Dam at Glenlivet Distillery	Bromley Borough Council	C. C. Doig, C.E., Elgin	Oct. 31
Ironmongery, Tools, Builder's Materials, etc.	Bombay, Baroda, etc., Railway Co.	Municipal Offices, Bromley, Kent	do.
Cast-iron Sleeper Pots	do.	T. W. Wood, Gloucester House, Bishopsgate-street Without, E.C.	do.
Pig-iron	Street U.D.C.	do.	do.
Collecting Tank at Rodney Stoke, near Cheddar	Huddersfield Corporation	A. P. I. Catterell, Engineer, Baldwin-street, Bristol	do.
Underground Lavatories, etc., Market-place	Llandaff and Dinas Powis R.D.C.	Borough Engineer, 1, Peel-street, Huddersfield	do.
Street Works, Clarke-street, etc., Ely	do.	J. Holden, Surveyor, 20, Park-place, Cardiff	do.
Pennon-hill Widening, etc., Llancarfan	do.	do.	do.
400 yds. of Kerbing in Whitchurch Village	do.	do.	do.
100 yds. of Drainage, Whitchurch	do.	do.	do.
Altera. etc., Christchurch Chapel, Llandrindod Wells	Congregational Chapel	Rhys Jones, Secretary, Trefecia House, Llandrindod Wells	Nov. 1
450 lineal yds. of 12-in. Stoneware Sewers, etc.	Easingwold R.D.C.	Fairbank & Son, Engineers, Lendal-chambers, York	do.
Temp. Bldgs., Hamilton (Trades Exhib. Sect. of Exhib.)	Arts and Crafts Exhibition	W. Hume, 52, Quarry-street, Hamilton	do.
64 Cottages at Chopwell	Consett Iron Co.	C. E. Oliver, Architect to Company, Consett	do.
*WAREHOUSE, NEW BRIDGE-ST., NEWCASTLE	North-Eastern Railway	Company's Architect, Central Station, Newcastle-on-Tyne	do.
Engine-house, Boiler-house, Dwelling-house, Appleby	Brumby and Frodingham U.D.C.	A. Atkinson, C.E., Brigg	Nov. 2
New Bulking adjoining Ferry Landing at Knot End	Fleetwood U.D.C.	E. Frobisher, Surveyor, Town Hall, Fleetwood	do.
Bookstacking for Library	Bristol Libraries Committee	H. P. Adams, Architect, 28, Woburn-place, Russell-square, London	do.
Stands, Tables, Desks, etc., for Library	do.	do.	do.
*FENCING A NEW ASYLUM, NR. COLCHESTER	Essex County Lun. Asy. Visit. Com.	County Architect, Chelmsford	do.
Elec. Light., etc., Scottish Temperance-bldgs., Belfast	Essex Ed. Com.—Tendering Ad.Com.	J. Woodside, A.M.I.E.E., Ocean-buildings, Belfast	Nov. 3
School, Bradfield, near Manningtree	Coxford R.D.C.	F. Whitmore, County Architect, Duke-street, Chelmsford	do.
Drain, 36 yds. in length, Duke-street, Bildeston	Cheshire C.C.	A. Newman, Clerk, Hadleigh, Suffolk	do.
Electric Wiring and Fittings, Stamford Park Schools	Maybole Town Council	J. Howarth, Education Offices, Market-street, Altrincham	do.
Bacterial Sewage Purification Works, etc.	Bexhill Corporation	J. Sturrock, Engineer, 65, King-street, Kilmarnock	do.
500 tons of Blue Quartzite Macadam	Staffordshire C.C.	G. Ball, Borough Surveyor, Town Hall, Bexhill	do.
*EXTENSIONS TO ADBASTON COUNCIL SCHOOL	Kirkmichael School Board	Graham Balfour, Education Offices, Stafford	Nov. 4
Plumber Work for Water Supply, Tomachlaggan Schl.	Paddington Borough Council	Town and County Bank, Tomintoul, N.B.	do.
*MAKING-UP AND PAVING DELAWARE-ROAD..	Finchley U.D.C.	Council's Surveyor, Town Hall, Paddington, W.	do.
Sewerage Works, North Finchley	Parc Isaf Building Club	Engineer and Surveyor, Church End, Finchley	Nov. 6
Twenty-five Houses, Barrett-street, Cwmpare	do.	Park Hotel, Cwmpare	do.
Formation of Roads, etc., Cwmpare	Kilmarnock District Committee	do.	do.
7 miles Cast-iron Pipes, etc. (Catrine Water Extension)	Bradford Guardians	Shaw & Morton, Engineers, 224, St. Vincent-street, Glasgow	do.
Extension, etc., of Subway at Hospital, Horton-lane	Gateshead Guardians	F. Holland, Engineer, 11, Parkinson's-ch., Hustlergate, Bradford	do.
Alterations to Workhouse Buildings, Bensham	Great Western Railway Co.	Newcombe & Newcombe, Archts., 89, Pilgrim-st., N'castle-on-Tyne	Nov. 7
*ERECTION OF FOUR COTTAGES AT TAPLOW..	Islington Borough Council	Engineer, Reading Station	do.
Galvanised Wrought-iron Shingle Bins, etc.	Woodford U.D.C.	J. Patten Barber, Borough Engineer, Town Hall, Upper-street, N.	do.
Making-up Wynndale-road	Willesden District Council	W. Farrington, Surveyor, Council Offices, Woodford Green	do.
*MATERIALS FOR EXTEN. PRECIPITA. TANKS	Messrs. C. & E. Roberts	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Reconstruction, etc., of Works, Hunslet	Glamorgan C.C.	J. B. Fraser, Architect, 8, Park-square, Leeds	Nov. 8
Additions, etc., to Deri Council School	do.	T. M. Franklen, Clerk, Westgate-street, Cardiff	do.
Offices, Tank, Ventilators, etc., Cowbridge Council Sch.	Featherstone U.D.C.	do.	do.
Sewerage, etc., Works, Station-lane	Essex Education Committee	F. B. Rothera, Engineer, District Council Offices, Featherstone	do.
*JARRAH WOOD FENCE AT BRAINTREE	South Mims R.D.C.	John Gleave, Hollywood, Braintree	do.
*WIDENING ROADS, ETC.	Hale U.D.C.	Council's Surveyor, 40, High-street, Barnet	do.
Making-up Broomfield-lane, Hale	Bradford Electricity Committee	T. Blagburn, Surveyor, Council Offices, Ashley-road, Hale, Cheshire	Nov. 10
Six Hand-fired Marine Type Boilers, etc.	Metropolitan Water Board	Electricity Offices, Whitaker-buildings, Victoria-square, Bradford	do.
Covered Reservoirs, Honor Oak	Lewisham Borough Council	District Engineer, Southwark Bridge-road, S.E.	Nov. 13
Roadworks, part of Boveney-road, Forest Hill	Kerry C.C.	Surveyor's Department, Town Hall, Catford	do.
County Hall, Tralee	Visit.Com., Salop & Montgomery Asy.	P. M. Quinlan, County Council Chambers, Courthouse, Tralee	Nov. 14
Corrugated Iron Isolation Hospital	Monmouthshire Educn. Committee	A. T. Davis, M.Inst.C.E., Shirehall, Shrewsbury	do.
Additions, etc., to Council School, Grosmont	Commissioners of H.M. Works, etc.	A. Swash, Architect, Midland Bank-chambers, Newport	Nov. 15
*NEW POST OFFICE, CANTERBURY	Gower R.D.C.	Postmaster, Canterbury	Nov. 17
Widening Road, South-road	do.	H. J. Ind, Clerk, Church-street, Swansea	Nov. 20
Widening Road, North-road	Gloucester Education Council	do.	do.
*EREC. OF SCHOOLS, DERBY-RD., GLOUCESTER	East Preston Guardians	J. F. Trew, Architect, Station-road, Gloucester	Nov. 21
Infirmary and Nurses' Home at Workhouse	Bromley Borough Council	A. Shelley, Clerk, Town Offices, Littlehampton	Nov. 24
*EREC. OF MUNICIPAL BUILDGS., TWEEDY-RD.	Staffs. Education Committee	F. R. Atkinson, Architect, 8, Sackville-street, W.	Nov. 27
*NEW INFTS.' COUNCIL SCHL. AT WALL HEATH	Hon. J. H. Savile	Graham Balfour, Stafford	No date.
Erecting Five Houses and Pulling Down Old Buildings	Frederick Hotel Co.	Foster, Wood, & Awdry, Architects, 35, Park-street, Bristol	do.
Draining Property in Thorner		J. Richardson, M.I.C.E., Savile Est. Office, E. Parade-chbrs., Leeds	do.
Electrical Plant, Hotel Majestic, Harrogate		Lee, 8, Bloomsbury-square, London, W.C.	do.
Warbery at Six Bells Colliery, Aberbeeg		J. Lancaster & Co., Ltd., Blaina, Mon.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*TWO DRAUGHTSMEN	Durham Education Authority	100*l.* each	Nov. 2
*ASSIS. ORGANI. TEACHER OF MANUAL TRAIN.	London C.C.	200*l.* per annum	Nov. 4

Those marked with an asterisk (*) are advertised in this number. **Competitions,** iv. **Contracts,** iv. vi. viii. x. **Public Appointments,** xviii.

PRICES CURRENT.—*Continued from page 457.*

WOOD (*continued*).

BUILDING WOOD (*continued*).	At per load of 50 ft.					
	£	s.	d.		£	s. d.
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	...	5	0 0
Seconds	4	0	0	...	4	10 0
Small timber (8 in. to 10 in.)	3	12	6	...	3	15 0
Small timber (6 in. to 8 in.)	3	0	0	...	3	10 0
Swedish balks	2	10	0	...	3	0 0
Pitch-pine timber (30 ft. average)	3	5	0	...	3	15 0
JOINERS' WOOD.	At per standard.					
White Sea: first yellow deals, 3 in. by 11 in.	24	0	0	...	25	0 0
3 in. by 9 in.	22	0	0	...	23	0 0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	...	18	0 0
Second yellow deals, 3 in. by 11 in.	18	10	0	...	20	0 0
,, ,, 3 in. by 9 in.	17	10	0	...	19	0 0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	...	14	10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	...	15	0 0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	...	12	0 0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	...	22	10 0
Do. 3 in. by 9 in.	18	0	0	...	19	10 0
Battens	13	10	0	...	15	0 0
Second yellow deals, 3in. by 11in.	16	0	0	...	17	0 0
Do. 3 in. by 9 in.	14	10	0	...	16	0 0
Battens	11	0	0	...	12	10 0
Third yellow deals, 3 in. by 11 in.	13	0	0	...	14	0 0
Do. 3 in. by 9 in.	12	10	0	...	14	0 0
Battens	10	0	0	...	11	0 0
White Sea and Petersburg—						
First white deals, 3 in. by 11 in.	14	10	0	...	15	10 0
,, ,, 3 in. by 9 in.	13	10	0	...	14	10 0
Battens	11	0	0	...	12	0 0
Second white deals, 3 in. by 11 in.	13	10	0	...	14	10 0
,, ,, 3 in. by 9 in.	12	10	0	...	13	10 0
,, ,, battens	10	0	0	...	11	0 0
Pitch-pine: deals	16	10	0	...	20	0 0
Under 2 in. thick extra	0	10	0		1	0 0
Yellow Pine—First, regular sizes	44	0	0	upwards.		
Oddments	32	0	0	,,		
Seconds, regular sizes	33	0	0	,,		
Yellow Pine oddments	28	0	0	,,		
Kauri Pine—Planks, per ft. cube	0	3	6	...	0	5 0
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	3	0	...	0	3 6
Small ,, ,,	0	2	6	...	0	2 9
Wainscot Oak Logs, per ft. cube	0	5	0	...	0	5 6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	...	0	0 9
¼ in. do. do	0	0	7	...		—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	...	0	1 0
Selected, Figury, per ft. super. as inch	0	1	6	...	0	2 6
Dry Walnut, American, per ft. super. as inch	0	0	10	...	0	1 0
Teak, per load	17	0	0	...	22	0 0
American Whitewood Planks, per ft. cube	0	4	0	...	0	5 0
Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	...	0	17 6
1 in. by 7 in. yellow, planed and matched	0	14	0	...	0	18 0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	...	1	0 0
1 in. by 7 in. white, planed and shot	0	12	0	...	0	14 6
1 in. by 7 in. white, planed and matched	0	12	6	...	0	15 0
1¼ in. by 7 in. white, planed and matched	0	15	0	...	0	16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	...	0	13 6
1 in. by 7 in. ,, ,,	0	14	0	...	0	18 0
¾ in. by 7 in. white ,, ,,	0	10	0	...	0	11 6
1 in. by 7 in. ,, ,,	0	12	9	...	0	15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.					
	£	s.	d.		£	s. d.
Rolled Steel Joists, ordinary sections	6	5	0	...	7	0 0
Compound Girders, ordinary sections	7	15	0	...	8	15 0
Steel Compound Stanchions	9	7	6	...	10	17 6
Angles, Tees, and Channels, ordinary sections	7	15	0	...	8	15 0
Fitch Plates	8	0	0	...	8	10 0
Cast Iron Columns and Stanchions including ordinary patterns	6	17	6	...	8	0 0

METALS.

	Per ton, in London.					
	£	s.	d.		£	s. d.
IRON—						
Common Bars	8	0	0	...	8	10 0
Staffordshire Crown Bars, good merchant quality	8	10	0	...	9	0 0
Staffordshire "Marked Bars"	10	0	0	...		—
Mild Steel Bars	8	15	0	...	9	0 0
Hoop Iron, basis price	9	5	0	...	9	10 0
,, ,, Galvanised	17	0	0	...		—
(*And upwards, according to size and gauge.*)						
Sheet Iron Black—						
Ordinary sizes to 20 g.	9	10	0	...		—
,, ,, 24 g.	10	10	0	...		—
,, ,, 26 g.	12	0	0	...		—
Sheet Iron, Galvanised, flat, ordinary quality—						
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	14	0	0	...		—
Ordinary sizes to 22 g. and 24 g.	14	10	0	...		—
,, ,, 26 g.	15	0	0	...		—
Sheet Iron, Galvanised, flat, best quality—						
Ordinary sizes to 20 g.	17	0	0	...		—
,, ,, 22 g. and 24 g.	17	10	0	...		—
,, ,, 26 g.	19	0	0	...		—
Galvanised Corrugated Sheets—						
Ordinary sizes 6 ft. to 8 ft. 20 g.	13	10	0	...		—
,, ,, 22 g. and 24 g.	14	0	0	...		—
,, ,, 26 g.	15	5	0	...		—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	10	0	...		—
Best Soft Steel Sheets, 22 g. & 24 g.	12	10	0	...		—
,, ,, 26 g.	14	15	0	...		—
Cut Nails, 3 in. to 6 in.	9	10	0	...	9	15 0
(Under 3 in., usual trade extras.)						

LEAD, &c.

	Per ton, in London.					
	£	s.	d.		£	s. d.
LEAD—Sheet, English, 3lb. and up.	17	10	0	...	—	
Pipe in coils	18	0	0	...	—	
Soil pipe	20	10	0	...	—	
Compo pipe	20	10	0	...	—	
ZINC—Sheet—						
Vieille Montagne ton	31	15	0	...	—	
Silesian	31	10	0	...	—	
COPPER—						
Strong Sheet per lb.	0	0	11	...	—	
Thin ,, ,,	0	1	0	...	—	
Copper nails ,,	0	0	11	...	—	
BRASS—						
Strong Sheet ,,	0	0	10	...	—	
Thin ,, ,,	0	0	11	...	—	
TIN—English Ingots ,,	0	1	5½	...	—	
SOLDER—Plumbers' ,,	0	0	7	...	—	
Tinmen's ,,	0	0	8½	...	—	
Blowpipe ,,	0	0	9½	...	—	

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2d. ,, ,,
21 oz. thirds	3½d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, fourths	3½d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, fourths	5d. ,, ,,
Fluted Sheet, 15 oz.	3½d. ,, ,,
,, 21 oz.	4½d. ,, ,,
⅛ Hartley's Rolled Plate	2d. ,, ,,
⅛ ,, ,, ,,	2½d. ,, ,,
¼ ,, ,, ,,	2½d. ,, ,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	1	6
,, ,, ,, in barrels	,,	0	1	7
,, ,, ,, in drums	,,	0	1	9
Boiled ,, in pipes	,,	0	1	8
,, ,, ,, in barrels	,,	0	1	9
,, ,, ,, in drums	,,	0	1	11
Turpentine in barrels	,,	0	4	2
,, in drums	,,	0	4	4
Genuine Ground English White Lead	per ton	20	0	0
Red Lead, Dry	,,	19	10	0
Best Linseed Oil Putty	per cwt.	0	6	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon.		
	£	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	13	0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDARE.—For erecting sixty-one houses, for the Gadlys Uchaf Building Club:—

	Per House.		Per House.
E. Davies	£265 10	L. Davies	£245 0
D. T. Davies	259 10	W. F. & Ll. Price	231 0
D. Rees	258 0	T. W. & J. Jenkins	224 10
R. Jones	255 0		

BO'NESS (N.B.).—For cast-iron and fireclay sewers in the western district, for the Town Council. Mr. J. P. Laurie, Borough Surveyor, Bo'ness. Quantities by Surveyor:—

R. Kilpatrick	£639	4	6
J. Adams & Co.	597	1	2
J. McKerracher	467	15	3
W. Mitchell & Son	£463	10	5
Jipps & Sudden	418	2	4
Baikie & Peattie	405	2	8

BOTCHESTON.—For erecting a Council school, etc., for the Leicestershire County Council Education Committee. Mr. W. Brand, architect, 33, Bowling Green-street, Leicester:—

H. Herbert & Son	£1,100	0	0
A. J. Wileman	1,090	0	0
W. F. Harding	1,089	7	6
Bradshaw Bros.	1,061	4	0
N. Dilks	1,042	9	9
Bentley & Co.	1,011	0	0
E. Fox	994	11	0
W. Hanson	970	0	0
E. Orton	964	10	0
Bowles & Son	963	17	0
Corah & Son	955	0	0
W. Moss	£930	17	6
Haskard, Rudkin, & Beck	928	0	0
G. F. Mason	925	0	0
T. Herbert	918	0	0
J. C. Kellett & Son	910	0	0
B. Shipman	882	0	0
Griffin Bros.			
Huggiescote*	877	0	0
J. Cole	876	12	5

BRISTOL.—For constructing a culvert and the erection of boundary walls, etc., at Eastville Workhouse, for the Guardians. Mr. T. J. Scoones, engineer, 10, Orchard-street, Bristol:—

J. Browning	£1,728	0	0
W. & J. Bennett	1,550	0	0
J. A. Woodward	1,475	0	0
R. H. B. Neale, Ltd.	1,416	0	0
H. H. Forse	1,275	0	0
H. G. Heard	1,263	7	0
J. Hatherley	1,247	0	0
E. Clark & Sons	£1,196	10	0
Thatcher Bros.	1,182	15	6
J. Perkins & Sons	1,140	0	0
S. Wood	1,129	3	10
E. Love, Redland*	1,109	0	0

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J. Hatherly	1,247	0	0
E. Clark & Sons	1,196	10	0
Thatcher Bros.	1,182	15	6
J. Perkins & Son	1,140	0	0
S. Wood	1,129	3	10
E. Love, Bristol*	1,109	0	0

BRITON FERRY.—For pulling down old buildings, erection of new power boiler-house, for the Cape Copper Co. Mr. J. M. V. Money-Kent, engineer, 17, Sloane-street, London:—

H. Billings	£1,027	W. H. Michael & Co.	£1,012

EASTBOURNE.—For erecting a fire station at the side of the Technical Institute, Grove-road, for the Corporation. Mr. P. A. Robson, architect, Palace-chambers, 9, Bridge-street, Westminster, S.W.:—

M. Hookham	£5,423	R. Cook & Sons	£4,914
W. Burgess	5,354	F. G. Minter	4,912
Norman & Burt	5,195	Miller & Selmes	4,847
J. Wood & Sons	5,190	A. J. White	4,834
Martin, Wells, & Co.	5,150	J. Longley & Co.	4,768
J. Garrett & Son	5,084	Peerless, Dennis, & Co., Langney-road, Eastbourne*	4,747
Strange & Sons	5,077		
E. Cornwall & Sons	5,062		
J. Martin	5,050	Rowland Bros.	4,659

EASTBOURNE.—For alterations and additions at Town Hall, for the Corporation. Mr. William Chapman Field, Borough Architect, Eastbourne.

Peerless, Dennis, & Co.	£543
M. Hookham, Springfield-road, Eastbourne*	449

GUILDFORD.—For alterations to buildings, underpinning, pile driving, and reconstruction of roof, for the Guildford Electricity Supply Co. Mr. J. M. V. Money-Kent, engineer, 17, Sloane-street, London:—

Tribe & Robinson	£328	Higlett & Hammond	£273

HALBERTON.—For taking down and rebuilding farmhouse at Halberton Court, Devon, for Mr. R. P. Elworthy. Mr. William Barrons, architect, Deepway, Tiverton:—

Tucker, Parr, & Pincott	£1,651	0	
J. Grater & Sons	1,524	0	
R. Hill & Son	1,440	0	
R. Grater & Sons	1,438	0	
E. Labdon & Sons	1,400	0	
S. Manning	£1,195	0	
H. Nott & Son	1,189	0	
Nicks Bros., Bradninels, Cullompton*	1,135	17	

HEREFORD.—For alterations to premises in Eign-street, for Mrs. Parker. Mr. W. E. H. Clarke, architect and surveyor, Cathedral Chambers, Hereford:—

E. J. Davies	£288	0	
W. Bolt	270	0	
R. Friend	260	0	
J. C. M. Vaughan	220	0	
C. Cooke	£204	0	
W. Powell	202	10	
E. W. Wilks	193	0	
Davies & Co.*	187	0	

[All of Hereford.]

HUNSTANTON.—For new building for children (Convalescent Home), for the Committee. Mr. A. Paul MacAlister, architect, 20, St. Andrew's-street, Cambridge:—

F. Giddings	£6,830	0	0
Oak Building Co.	6,630	0	0
Read & Wildbur	6,310	0	0
J. Medwell	6,253	0	0
F. Newton	5,992	0	0
J. Cracknell	5,948	0	0
J. Youngs & Son	5,946	0	0
Tash, Langley, & Co.	5,800	10	0
Redding & Son	5,830	0	0
G. W. Heath	5,813	0	0
R. Dye	£5,762	0	0
R. Shanks	5,695	0	0
J. Bridgefoot & Son	5,650	3	6½
Willmatt & Sons	5,636	0	0
F. Southgate	5,537	0	0
F. Anderson	5,370	0	0
Clark & Sons, Cambridge*	5,343	0	9
Hipwell & Co.	5,336	0	0
D. Grays	5,270	0	1
J. Guttridge	4,977	0	0

LONDON.—For the erection of dairy premises at the rear of No. 3, Perry-vale, Forest Hill, for Messrs. Edwards & Sons. Messrs. Bingham & Broughton, architects, Crofton Park, S.E.:—

A. Black & Sons..	£255 0	F. Tingley	£208 0
E. C. Christmas ..	233 0	Bliss Bros.	203 10

LONDON.—For the supply of cables and electric plant, through tramways route from Strand to the "Angel," Islington, for the London County Council:—

Supply of Low-tension Cables.

Anchor Cable Co., Ltd.	£4,141 5 4
Siemens Bros. & Co., Ltd.	4,093 12 4
British Insulated & Helsby Cables, Ltd.	4,068 10 0
Callender's Cable and Construction Co., Ltd., London*	4,025 4 4

Laying of Cable-Ducts.

J. Mowlem & Co., Ltd.	£4,435 0
British Insulated and Helsby Cables, Ltd.	2,992 0
Reid Bros.	2,974 8
J. A. Ewart, London*	2,813 14

NORWICH.—For the erection of billiard-room, bath-rooms, etc., at Irstead House, Norwich, for Mr. J. R. Nutman. Messrs. Morgan & Buckingham, architects, Norwich. Quantities by architects:—

C. Wiseman	£1,035	J. Youngs & Son, Norwich*	£893
J. S. Smith	949		
T. Gill	924		

ORMSKIRK.—For certain building work at workhouse, for the Guardians. Mr. J. Dod, architect, D 16, Exchange-buildings, Liverpool:—

H. E. B. Greene & Co.	£865 0	T. Riding & Son..	£718 6
		J. Whittle	715 0
W. Hall & Son, Ltd.	797 0	J. Robinson & Son	710 10
		R. Taylor & Son .	674 10
J. Pilkington	735 0	Costain & Sons, Liverpool*	620 0
F. W. Mayor & Co.	735 0		
Duthie & Dobson	733 10		

PENARTH.—For erecting Wesleyan chapel and schools, etc., at the corner of Albert-crescent and Albert-road. Mr. H. Budgen, architect, 95, St. Mary-street, Cardiff:—

W. Thomas & Co.	£13,500	E. Turner & Sons	£11,488
W. Williams	13,400	G. Hallett	11,450
J. Hatherly	13,200	J. E. Evans	10,900
Shepton & Sons ..	12,397	J. Jones	10,770
Smith, Jones, & Sons	12,260	E. T. Bevan	10,700
D. Davies	11,554	D. G. Price, Penarth†	10,600

PONTNEWYDD.—For erecting two houses for Mr Llewellyn Williams. Messrs. Swalwell & Havard, architects and surveyors, Dock-street, Newport:—

C. H. Reed	£959 0 0	J. Dean & Son..	£699 0 0
D. W. Richards	941 0 0	A. S. Morgan & Co.	650 0 0
J. Jenkins, Ltd.	875 0 0		
W. L. Walker..	840 19 7	Poulton & Whiting, Pontnewydd, Mon.*	600 0 0
J. H. Leadbeater	700 0 0		
J. B. Jenkyns..	765 0 0	H. Beese & Son	576 19 0
Knowler & Herbert	750 0 0		

RUSHDEN (Northants).—For erecting Council offices, in Newton-road, for the Urban District Council. Mr. W. B. Madin, C.E., Surveyor, Vestry Hall, Rushden. Quantities by Surveyor:—

T. Wilmott, jun.	£2,697 0	Hacksley Bros. .	£2,490 0
T. Hickman....	2,568 0	Berrill & Green	2,460 0
Harrison & Windsor.....	2,566 10	Kettering Co-op. Builders	2,411 0
Whittington & Tomlin	2,535 0	Goodman & Murkett	2,395 0
Brown & Son ..	2,520 0	R. Marriott, Rushden‡ ..	2,365 0
C. E. Bayes....	2,499 0		
W. Packwood..	2,497 16		

[Surveyor's estimate, £2,497.]

‡ Accepted subject to consent of the Local Government Board to a loan for carrying out the works.

RYE.—For building a water tower, Rye Workhouse, for the Rural District Council. Mr. E. J. Cory, Surveyor, High-street, Rye.

Ellis Bros., Rye £1,187 10

[This includes the laying of water mains].

SLEAFORD.—For additions to master's house at Sleaford, for the Governors of Carre's Grammar School. Mr. Jesse Clare, architect, Sleaford:—

H. Rose, West Banks, Sleaford £930

SWANSEA.—For the erection of new machinery-house, and laying main drain through the works, for the English Crown Spelter Co. Mr. J. M. V. Money-Kent, engineer, 17, Sloane-street, London:—

H. Billings	£675	Lloyd Bros.*	£617
W. H. Michael & Co..	630		

WESTMINSTER.—For paving Jermyn-street, west of Lower Regent-street, with asphalt:—

	Per yd. super. s. d.
Val de Travers Asphalt Co.	8 3
Limmer Asphalt Co.	8 1
French Asphalt Co.*	7 9

[Estimated value of tender £660.]

WALSALL.—For the erection of a manual instruction centre for twenty boys, in connexion with North Walsall Schools, for the Education Committee. Messrs. Bailey & McConnal, architects, Bridge-street, Walsall:—

T. Tildesley, New-road, Willenhall, Staffs. £375

WOLVERTON.—For the erection of new secondary school for about 165 children, from plans and specifications prepared by Messrs. Harrington, Ley, & Kerkham, 65, Bishopsgate-street Without, E.C., and quantities prepared by Messrs. Farthing & Son, 46, Strand, W.C.:—

F. Wood & Co.	£5,660 0 0
T. Yirrell	5,595 0 0
W. J. Bloxham	5,586 0 0
A. J. Colborne	5,559 0 0
Martin, Wells, & Co.	5,499 0 0
S. Page & Son	5,460 0 0
A. J. Chown	5,030 0 0
Coulson & Lofts	4,996 0 0
W. J. Sturgess & Son	4,915 15 6
G. Tombs & Sons	4,900 0 0
G. Henson & Son	4,838 0 0
T. Stimson	4,741 0 0
A. P. Hawtin	4,629 0 0
C. Wright	4,619 0 0
H. Martin	4,580 0 0
C. H. Hunt & Son	4,573 0 0
G. J. Fisher	4,560 0 0
E. Archer	4,543 0 0
J. Parren & Son	4,532 3 0
A. Nash	4,525 0 0
W. Higgins	4,485 0 0
Hacksley Bros.	4,449 0 0
W. Heap	4,399 0 0
Kettering Co-op. Builders	4,350 0 0
E. Green, 24, Palmerston-road, Northampton*	4,088 0 0

Front Boundary Walls.

E. Green, Northampton*	£135

WOLVERTON.—For the erection of girls and infants' school, to accommodate 820 children, and also cookery centre, from plans and specifications prepared by Messrs. Harrington, Ley, & Kerkham, 65, Bishopsgate-street Without, E.C., and quantities prepared by Messrs. W. T. Farthing & Son, 46, Strand, W.C.:—

G. Tombs & Sons	£10,426 12 6
F. Wood & Co.	10,178 0 0
J. Barker & Co.	9,953 0 0
W. J. Bloxham	9,935 0 0
Sturgess & Son	9,800 0 0
W. E. Bennett	9,402 0 0
W. J. Dickens	9,250 0 0
J. Parnell & Son	9,240 0 0
A. J. Colborne	9,169 17 7
Coulson & Lofts	8,875 0 0
H. Martin	8,780 0 0
C. H. Hunt & Son	8,773 0 0
A. P. Hawtin	8,772 0 0
G. Henson & Son	8,728 0 0
A. W. Nash	8,685 0 0
W. Heap	8,680 0 0
G. H. Gibson	8,584 0 0
J. Honour & Son	8,495 0 0
Parren & Son	8,493 0 0
T. Hickman	8,437 0 0
W. Moss & Sons, Ltd.	8,417 0 0
C. Wright	8,150 0 0
Kettering Co-operative Builders, Ltd.	8,006 4 0
E. Archer, Central Joinery Works, Northampton†	7,846 0 0

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